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Chlamydiaceae in wild, feral and domestic pigeons in Switzerland and insight into population dynamics by *Chlamydia psittaci* multilocus sequence typing

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1. Summary

1.1 Summary

Feral pigeons (FP), common wood pigeons (CWP) and Eurasian collared doves (ECD) are the most common representatives of the *Columbidae* family in Switzerland and are commonly found in highly populated, urban areas. Pigeons may carry various members of the obligate intracellular *Chlamydiaceae* family, particularly the zoonotic *Chlamydia psittaci (C.p.)* and *C. avium (C.a.)*. In this study, 431 pigeons (FP, domestic pigeons (DP), CWP, ECD) from Switzerland, were investigated for the presence of *Chlamydiaceae*. Samples consisted of pooled swabs (choana, cloaca), liver samples, and paired swab and liver samples. All 636 samples were screened for *Chlamydiaceae* using a family-specific 23S ribosomal RNA (rRNA) real-time PCR (qPCR). Species identification was performed by DNA-microarray assay, sequencing of a 16S rRNA gene fragment and a *C.p.* specific qPCR.

In total, 16.9% (n = 73) of the pigeons tested positive for *Chlamydiaceae*, with 68 being positive for *C.p.*, four for *C.a.* and one for both. Infection rates of FP (19.8%) and DP (14.7%), were higher compared to CWP (5.7%) and ECD (5.1%). A further analysis of twelve selected *C.p.*-positive samples by multilocus sequence typing revealed closely related sequence types (ST) within different Swiss cities, while ST between cities were distinct. Considering the high prevalence of *C.p.* in DP and FP, close or frequent contact to these birds poses a potential human health risk.

Keywords: *Chlamydiaceae*, pigeon, Switzerland, MLST, *Chlamydia psittaci*

1.2 Zusammenfassung

Strassentauben (StrT), Ringeltauben (RT) und Türkentauben (TT) sind die häufigsten Vertreter der *Columbidae*-Familie in der Schweiz und werden häufig in dicht bewohnten, urbanen Gebieten angetroffen. Tauben können verschiedene Vertreter der Familie *Chlamydiaceae,* obligat intrazelluläre Bakterien, in sich tragen, allen voran *Chlamydia psittaci (C.p.)* und *C. avium (C.a.).* In der aktuellen Studie wurden 431 Tauben (StrT, Haustauben (HT), RT, TT) aus der Schweiz auf das Vorkommen von *Chlamydiaceae* untersucht. Das Probenmaterial bestand aus gepoolten Tupfern (Choane, Kloake), Leberproben und gepaarten Tupfer- und Leberproben. Alle 636 Proben wurden mittels Familien-spezifischer 23S ribosomaler RNA (rRNA) real-time PCR (qPCR) auf *Chlamydiaceae* getestet. Die Speziesidentifikation wurde mittels DNA-microarray assay, Sequenzierung eines 16S rRNA Gen Fragmentes und einer *C.p.* qPCR durchgeführt.

Insgesamt wurden 16.9% (n = 73) der Tauben positiv auf *Chlamydiaceae* getestet, 68 davon auf *C.p.*, vier auf *C.a.* und eine auf *C.p.* und *C.a.*. Die Infektionsrate von StrT (19.8%) und HT (14.7%) war im Vergleich zu RT (5.7%) und TT (5.1 %) höher. Eine Analyse von zwölf ausgewählten *C.p.* positiven Proben mittels multilocus sequence typing zeigte nahverwandte Sequenztypen (ST) innerhalb verschiedener Schweizer Städte, während sich die ST zwischen den Städten unterschieden. Durch die hohe Prävalenz von *C.p.* in StrT und HT stellt der Kontakt zu diesen Tauben ein Gesundheitsrisiko für den Menschen dar.

Stichworte: *Chlamydiaceae*, Tauben, Schweiz, MLST, *Chlamydia psittaci*

2. Introduction

Members of the *Chlamydiaceae* family are gram negative, obligate intracellular bacteria with a biphasic developmental cycle. The single genus *Chlamydia* (*C.*) consists of thirteen species and three Candidatus species (Vorimore et al. 2013; Taylor-Brown et al. 2015; Taylor-Brown et al. 2016). The most well-known chlamydial species harbored in birds is *C. psittaci*, which has been reported in at least 467 bird species belonging to 30 different orders (Kaleta and Taday 2003). This pathogen causes asymptomatic to severe systemic infections in several bird species, depending on susceptibility of the host species, immune status, infectious dose and virulence of the strain involved (Shewen 1980). Transmission can occur by inhalation of contaminated dust, feather particles and respiratory tract secretions (Harkinezhad et al. 2009a). In birds, bacterial shedding can be intermittently activated by stressful events such as breeding, migration or other illnesses, without presentation of clinical symptoms (Shewen 1980). *C. psittaci* is a zoonotic agent causing ornithosis. First human infections in Switzerland were documented during an outbreak of pneumonia in 1879 (Ritter 1879). Ornithosis is an influenza-like illness, typically causing headache, myalgia, malaise, fever and chills, with or without respiratory involvement (Andersen and Vanrompay 2000) potentially leading to atypical pneumonia with fatal outcome in rare occasions (Vanrompay et al. 2007). Humans contract disease during close contact with birds by inhalation of respiratory secretions or dust containing dried feces (Harkinezhad et al. 2009a).

Based on the outer membrane protein A (OmpA), *C. psittaci* is divided into nine genotypes and several subtypes, which are more or less associated with different hosts. Seven of these genotypes are generally found in avian hosts (A-F, E/B), the other two are believed to be associated mainly with infection in mammalian hosts (WC in cattle, M56 in rodents) (Vanrompay et al. 1997; Geens et al. 2005; Andersen 1991, 1997). Genotypes A and F are primarily found in psittacine birds, B in pigeons, C in ducks and geese and D in turkeys. Genotype E infects a broad range of birds including pigeons (Andersen 1997), while E/B has been described in ducks (Geens et al. 2005). Human infections are most frequently associated with genotype A, causing more severe infections than other genotypes (Rehn et al. 2013; Read et al. 2013; Wallensten et al. 2014; Cadario et al. 2017).

C. avium, another chlamydial species infecting birds, was first described in 2014 (Sachse et al. 2014) and has so far been reported in feral pigeons from Italy, France, Germany and the Netherlands, in a parrot from Germany and in a mallard from Poland (Sachse et al. 2014; Szymańska-Czerwińska et al. 2017; Burt et al. 2018). To date, it is still unclear whether it causes disease in birds, if it has zoonotic potential or how it is transmitted.

In pigeons, several chlamydial species have been described, including *C. psittaci* (the most common *Chlamydia* species identified in pigeons), *C. avium*, *C. abortus*, *C. pecorum* and *C. trachomatis* (Sachse et al. 2012). *C. psittaci* is the only *Chlamydiaceae* species identified in Swiss feral pigeons to date (Haag-Wackernagel 2006; Zweifel et al. 2009; Geigenfeind et al. 2012) and in general, research in avian Chlamydia seems to focus on *C. psittaci* in feral pigeons. Worldwide, several studies on *C. psittaci* in feral pigeons have been conducted to date, revealing a seroprevalence of up to 95.6%, while chlamydial DNA could be detected in

up to 50% of the tested pigeons (Magnino et al. 2009). Especially in cities, feral pigeons can build large populations of more than 300-400 pigeons per km^2 due to easy accessible food sources, leading to more stressed and diseased birds and thus to an increased risk for pathogen transmission to humans (Shewen 1980; Dinetti and Gallo-Orsi 1998). Additionally, close contact to feral pigeons through feeding or the close proximity to breeding sites, and also via running ventilation systems on balconies or attics, may increase the likelihood for zoonotic transmission of *C. psittaci*.

The Swiss feral pigeon population has been stable or has even decreased in the last 20 years (Knaus 2018), due to different population management programs, e.g. culling schemes or reduction of food availability. In 2001, Lucerne introduced a population management program (Haag-Wackernagel 2016; Keller 2007) primarily focusing on banning public feeding and educating the public about the negative effects on human and animal health resulting from intense pigeon populations (Keller 2007). Additionally, two pigeon lofts were built to attract the birds. Droppings accumulating in the lofts are disposed resulting in a decreased fecal load in the city reducing the damaging effect of feces on buildings and monuments, as well as decreasing the risk of disease transmission to humans. In 2012, a different population management program was introduced in Berne consisting of catching as many pigeons as possible and subsequent euthanasia of clinically unhealthy birds as well as endoscopic sterilization of males. In addition, all caught pigeons were ringed and placed in one of five pigeon lofts. If unmarked pigeons were observed breeding in the loft, their eggs were replaced with artificial ones. Additionally, the public was educated to refrain from public feeding. Both of these city loft programs were successful: the pigeon population has decreased from around 7'000 individuals in 2001 to 2'500 in 2015 in Lucerne and from around 10'000 in 2011 to currently 1'500 birds in Berne (Keller 2007; Stadt Luzern 2015). In Zurich, the feral pigeon population is managed primarily by culling and, to a smaller extent, by educating the public to refrain from feeding feral pigeons. In 2019, an estimated 16'000 feral pigeons lived in the city of Zurich (Stadt Zürich 2019).

Switzerland is home to five different species of free roaming pigeons: feral pigeons (*Columba livia domestica*), common wood pigeons (*Columba palumbus*), stock doves (*Columba eonas*), Eurasian collared doves (*Streptopelia decaocto*) and European turtle doves (*Streptopelia turtur*). In areas inhabited by humans, feral pigeons, common wood pigeons and Eurasian collared doves are well documented with a tendency towards increasing populations for the last two species (Knaus 2018). These three pigeon species are potential hosts for *Chlamydia psittaci* (Kaleta and Taday 2003) and possibly other *Chlamydia* species. However, there is no data available about the presence of *C. psittaci* and other *Chlamydia* species in Swiss wild pigeon populations. The present study aimed at collecting baseline data on the presence of *Chlamydiaceae* in three different free roaming Swiss pigeon species (feral and domestic pigeons, common wood pigeons and Eurasian collared dove), with insights into the population genetics of *C. psittaci* by using typing schemes such as *ompA* genotyping and multilocus sequence typing (MLST) (Sachse et al. 2008; Pannekoek et al. 2010).

3. Material and Methods

3.1 Samples

A total of 636 samples from 431 pigeons belonging to the three species i) *Columbia livia domestica*, i.e. domestic (homing pigeons, fancy pigeons, flying/sporting pigeons) and feral pigeons ("city pigeons"), ii) Eurasian collared dove (*Streptopelia decaocto*) and iii) common wood pigeon (*Columba palumbus*) from different geographical areas in Switzerland between May 2014 and October 2018 were analyzed. Individual samples consisted of combined choanal/cloacal swabs (c/c-swabs; n = 174) and liver samples (n = 52). Additionally, paired samples of c/c-swab and liver (n = 107), and cloacal swab (c-swab) and liver (n = 98) were available (Table 1). Samples derived from the diagnostic service of the National Reference Centre for Poultry and Rabbit Diseases (NRGK) and originated from birds found at various locations admitted to the rehabilitation center of the Swiss Ornithological Institute in the Canton of Lucerne and from feral pigeons inhabiting three of the five pigeon lofts in Berne ("A", "B" and "C"). Additional samples from feral pigeons culled by the game warden in the context of the local population control program in the city of Zurich and surrounding areas (greater Zurich area) completed the sample set (Table 2). The majority of the rehabilitation center pigeons inhabited rural regions, like small villages or farmland (Table 2). Upon collection and until DNA extraction, the swabs and liver samples were stored at -20°C, samples from Zurich were stored at -80°C.

Table 1. Number of pigeons according to sample material and species.

	Single samples		Paired samples	
Species	**C/c-swab**	**Liver**	**C/c-swab* + liver**	**C-swab** + liver**
Feral pigeon	142	47	36	98
Domestic pigeon	17	2	15	0
Eurasian collared dove	12	1	26	0
Common wood pigeon	3	2	30	0
Total	174	52	107	98

*C/c-swab = combined choanal/cloacal swab; **C-swab = cloacal swab.

Table 2. Number of pigeons as of place of origin.

Place of origin	**Berne**	**Greater Lucerne area***	**Greater Zurich area**	**Various****	**Total**
Feral pigeon	123	23	142	35	323
Domestic pigeon	0	8	0	26	34
Eurasian collared dove	0	2	3	34	39
Common wood pigeon	0	13	1	21	35

*Lucerne, Kriens, Horw, Emmen, Emmenbruecke, Rothenburg

**More rural places as compared to the city areas within the cantons Lucerne, Obwalden, Nidwalden, Schwyz, Zug, Aargau, Solothurn, Zurich, Schaffhausen, Basel-Land, Thurgau and St. Gallen.

3.2 DNA extraction

DNA was extracted using a commercial kit (Genomic DNA from tissue, *NucleoSpin® Tissue* from *Macherey-Nagel*, Düren, Germany) according to the manufacturer's instructions. For each extraction lot, a negative extraction control was prepared by using "Buffer T1" instead of the sample. Extracts were stored at -20°C until further analysis was performed. Extracted DNA was measured on a Nanodrop 2000c spectrophotometer (Thermo Fisher Scientific, Waltham, MA, USA) to determine DNA quantity and quality (260/280 value).

3.3 *Chlamydiaceae* screening of extracted DNA

All extracted DNA samples (n = 636) were investigated according to the decision tree as depicted in Figure 1. All primers and probes used in this study are listed in Table 3.

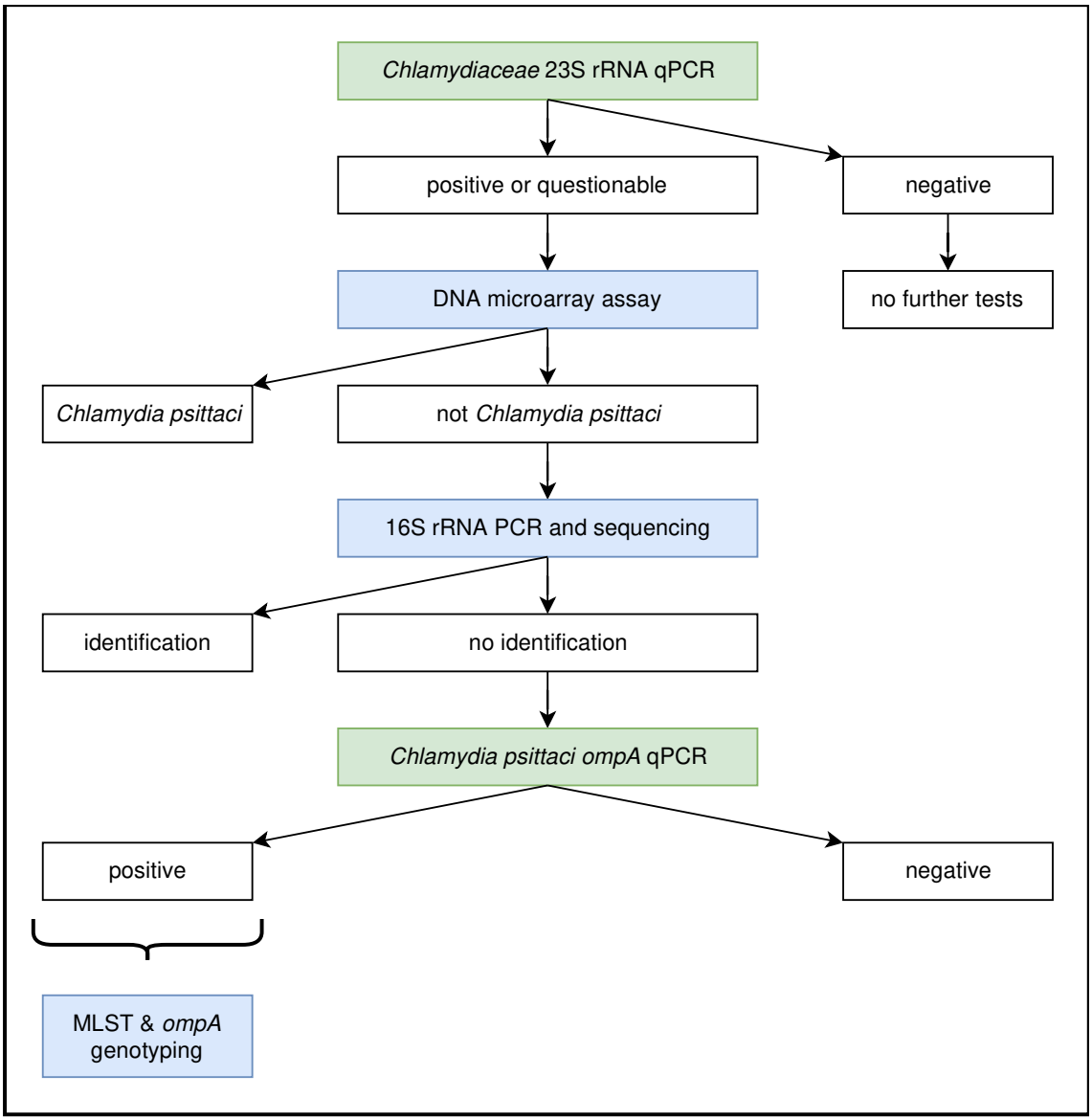

Figure 1. Decision tree for step-wise typing of samples originating from pigeons. Green-colored boxes mark methods using quantitative PCRs, while conventional PCRs are colored in blue. Out of 86 *C. psittaci*-positive samples, 12 selected samples were further characterized by multilocus sequence typing (MLST) and *ompA* genotyping.

3.3.1 Quantitative and conventional PCRs

All quantitative PCRs (qPCR; Figure 1, Table 3) were run on an Applied Biosystems® 7500 Real-Time PCR System (Thermo Fisher Scientific). As internal amplification control, eGFP was added to the reaction mix (Hoffmann et al. 2006).

Products from all conventional PCRs (Figure 1, Table 3) were purified using the QIAquick® PCR Purification Kit (Qiagen) according to the manufacturer's instructions.

Purified amplicons were Sanger sequenced by Microsynth (Balgach, Switzerland) (Staub et al. 2018). The obtained sequences were assembled and analyzed using the CLC Main Workbench 8 software and compared against the NCBI database using the BLASTn tool (NCBI, https://blast.ncbi.nlm.nih.gov/) or the MLST database (http://pubmlst.org/chlamydiales/).

Table 3. Primer and probes for different quantitative PCR (qPCR) and conventional PCR (PCR) tests used in this study.

Method	Target	Final concentration	Primer & Probe	Sequence (5'-3')	Amplicon size (base pairs)	Annealing temperature (°C)	References
Chlamydiaceae 23S rRNA qPCR	23S rRNA	500 nM	Ch23S-F	CTGAAACCAGTAGCTTATAAGCGGT	111	60	Ehricht et al. (2006)
			Ch23S-R	ACCTCGCCGTTTAACTTAACTCC			
		200 nM	Ch23S-p	FAM-CTCATCATGCAAAAGGCACGCCG-TAMRA			
	eGFP	200 nM	eGFP-1-F	GACCACTACCAGCAGAACAC	177		Hoffmann et al. (2006)
			eGFP-10-R	CTTGTACAGCTCGTCCATGC			
			eGFP-HEX	HEX-AGCACCCAGTCCGCCCTGAGCA-BHQ1			
DNA microarray assay PCR	23S rRNA	500 nM	U23F-19	ATTGAMAGGCGAWGAAGGA	171	50	Ehricht et al.(2006), Borel et al. (2008)
			23R-22	biotin-GCYTACTAAGATGTTTCAGTTC			
	eGFP	50 nM	eGFP-11-F	CAGCCACAACGTCTATATCATG	276		Hoffmann et al. (2006)
			eGFP-10-R-Bio	Bio-CTTGTACAGCTCGTCCATGC			
16S rRNA PCR	16S rRNA	300 nM	16S IGF (short)	GATGAGGCATGCAAGTCGAACG	278	58	Pospischil et al. (2012)
			16S IGR (short)	CCAGTGTTGGCGGTCAATCTCTC			
C. psittaci ompA qPCR	*ompA*	900 nM	CppsOMP1-F	CACTATGTGGGAAGGTGCTTCA	76	60	Pantchev et al. (2009)
			CppsOMP1-R	CTGCGCGGATGCTAATGG			
		200 nM	CppsOMP1-S	FAM-CGCTACTTGGTGTGAC-TAMRA			
	eGFP	900 nM	eGFP-1-F	GACCACTACCAGCAGAACAC	132		Hoffmann et al. (2006) PCR modified by Blumer et al. (2011)
			eGFP-2-R	GAACTCCAGCAGGACCATG			
		200 nM	eGFP-Hex	HEX-AGCACCCAGTCCGCCCTGAGCA-BHQ1			
MLST PCR	*eno*A	200 nM	YPenoA3	CCTATGATGAATCTCATTAATGG	450 – 500	53	Pannekoek et al. (2010)
			YPenoA4	CCCAACCATCAAAATCTTCTTCCG			
	*fum*C		YPfumC1	GGGCTCCTGAGGTTATGCC	500 – 600	53	
			YPfumC2	CGCAAATAATGAATCACCTTATC			
	*gat*A		YPgatA3	GCCTTAGAGTTAAGAAATGCCG	500 – 600	60	
			YPgatA4	CCCCCTGTATCGGAACCTAACGC			
	*gid*A		YPgidA1	GCTTATTAGAGAGCTGTCCTGGC	500 – 670	53	
			YPgidA2	CGCGTTTTCTAACCCACGG			
	*hem*N		YPhemN1	GGATCCATTTCGGAGGAGGC	500 – 630	53	
			YPhemN2	CCTGAAAGGATTTTCTCATGG			
	*hfl*X		YPhflX3	GAGATTTTTGCTAATCGAGCG	500 – 610	53	
			YPhflX4	GTAAAACATCTTCATGTAACGC			
	oppA		YPoppA3	ATGCGCAAGATATCAATGGG	500 – 610	60	
			YPoppA4	GGCAAGGTTTGGTGTAACTCGC			
ompA PCR	ompA	200 nM	ompA F (CTU)	ATGAAAAAACTCTTGAAATCGG	1200	49	Sachse et al. (2008)
			ompA rev	TCCTTAGAATCTGAATTGAGC			

3.4 *Chlamydiaceae* qPCR

The samples were analyzed with the 23S rRNA-based *Chlamydiaceae* family-specific qPCR (Ehricht et al. 2006) as modified by Blumer et al. (2011). All samples were tested in duplicate and the cycle threshold was set at 0.1 in each run. A sevenfold dilution series of *C. abortus* DNA was included in each run as a standard curve, while molecular grade water was used as a negative control. Samples were interpreted as positive if the mean cycle threshold (Ct value) was < 38. Samples with higher Ct values or inhibited amplification were re-tested in duplicate. Samples repeatedly showing a Ct value > 38 were considered as positive. The *Chlamydiaceae* copy number per µl was determined directly by the PCR instrument using the standard curve, calculating the percentage of *Chlamydia*-DNA out of total DNA (*Chlamydia*-%).

3.5 DNA microarray assay

The sample DNA, including internal control DNA (In type IC-DNA, Qiagen Labor, Leipzig, Germany), was amplified and biotin labelled using the method described by Borel et al. (2008). The cycle conditions were 96°C for 10 min, followed by 39 cycles of 94°C for 30 s, 50°C for 30 s and 72°C for 30 s and a last step of 72°C for 4 min. The labelled DNA was hybridized using the Hybridization Kit 245200100 (Alere Technologies GmbH; now Abbott, Chicago, Illinois, USA) and analyzed using the ArrayStrip^{TM} system (ChlamType-23S AS-4 Kit, Alere Technologies GmbH, Jena, Germany), as established by Borel et al (2008). With the current kit, eleven *Chlamydia* species and nine *Chlamydia*-like organisms can be identified.

3.6 16S ribosomal RNA (rRNA) PCR

The conventional 16S rRNA PCR was performed as described by Pospischil et al. (2012), using the primers 16S IGF (short) and 16S IGR (short) to amplify a sequence of 298 base pairs (bp) (Table 3).

Per sample, a 50 µl reaction mix was prepared, containing 1 µl (< 150 ng/µl) sample template, 1x PCR buffer with $MgCl_2$ (Roche Diagnostics GmbH), 0.5 mM $MgCl_2$ Stock Solution (Roche Diagnostics GmbH), 0.2 nM dNTP (PCR Nucleotide Mix, Roche Diagnostics GmbH), 300 nM of both the forward (16S IGF) and the reverse (16S IGR) primers and 0.02 U/µl FastStart Taq DNA Polymerase.

Cycling conditions were 95°C for 5 min, followed by 40 cycles of 95°C for 60 s, 65°C for 60 s and 72°C for 90 s and a final extension of 72°C for 10 min.

3.7 *C. psittaci* quantitative PCR

The *C. psittaci*-specific qPCR was performed according to the protocol as described by Pantchev et al. (2009). The primers CppsOMP1-F and CppsOMP1-R and probe CppsOMP1-S were used. The reaction mix contained 4 µl (< 150 ng/µl) sample template, 1 µl eGFP template, 1x TaqMan Universal PCR MasterMix, 900 nM of the primers CppsOMP1-F and CppsOMP1-R, 200 nM probe CppsOMP1-S, 900 nM of the primers eGFP-1-F and eGFP-2-R and 200 nM probe eGFP-HEX (Hoffmann et al. 2006) in a final volume of 25 µl.

3.8 *C. psittaci* typing

Twelve *C. psittaci* strains were selected for further characterization by performing *C. psittaci*-specific multilocus sequence typing (MLST) as described by Pannekoek et al. (2010) and genotyping based on the major outer membrane protein (OmpA) gene (Sachse et al. 2008). Selection aimed at creating a sample subset that represents the diversity of the main sample set. It was based on (I) geographical location (city, pigeon loft), (II) *Chlamydia*-% (>0.002%), (III) pigeon species and (IV) positive or negative result of the respective paired liver sample.

3.9 Multilocus sequence typing

The conventional PCRs targeting seven housekeeping genes were performed as described (Pannekoek et al. 2010). For each sample, a 50 µl reaction mix was used, containing 1x AmpliTaq Gold™ 360 Master Mix (Thermo Fisher Scientific), 200 nM of each primer (Table 3) and 3 µl sample template with a DNA concentration of 25 ng/µl. Cycling conditions were 95°C for 10 min, followed by 35 cycles of 95°C for 30 s, 53°C (*eno*A, *fum*C, *gid*A, *hem*N, *hfl*X) or 60°C (*gat*A, *opp*A) for 30 s, 72°C for 60 s and a final step at 72°C for 7 min. If amplification resulted in weak bands, a modified cycling protocol with 40 cycles of 95°C for 60 s, 53°C/60°C° for 60 s, 72°C for 90 s was used. Subsequently, the PCR products were analyzed as mentioned above. The alignments of the concatenated sequences (3098 bp) were generated using MAFFT as implemented in Geneious 11.0.5 (Kearse et al. 2012). The mid-point rooted Bayesian tree was constructed using the concatenated MLST 3098 bp MAFFT alignment with the MrBayes program (as implemented in Geneious). The tree parameters included: GTR +G nucleotide model, with 4 MCMC chains with million generations, sampled every 1'000 generations and with the first 100'000 trees discarded as burn-in. The additional strains used for Bayesian analysis as shown in Figure 2 are listed in Supplementary Table S1. The MLST sequences generated in this study are deposited in PubMLST/Chlamydiales (https://pubmlst.org/chlamydiales/).

3.10 *OmpA* genotyping

Each reaction mix with a final volume of 50 µl contained 1x AmpliTaq Gold™ 360 master mix (Thermo Fisher Scientific), 200 nM of the primers CTU and ompA rev (Sachse et al.

2008) and 3 µl sample template with a DNA concentration of 25 ng/µl. Cycling conditions were 10 min at 95°C, followed by 35 cycles of 95°C for 30 s, 49° for 30 s, 72°C for 60 s and a final elongation at 72°C for 7 min. If amplification resulted in weak bands, a modified cycling protocol with 40 cycles of 95°C for 60 s, 49° for 60 s, 72°C for 90 s was used. Alignments of the 1050 bp sequences and Bayesian analysis was performed as described above. The *C. psittaci* strains used for Bayesian analysis as shown in Figure 3 are listed in Supplementary Table S1. The sequences generated in this study are available in Genbank under accession numbers MK805041 – MK805052.

4. Results

4.1 *Chlamydiaceae* PCR revealed an average prevalence of 16.9% in Swiss pigeons

A total of 70 swab (18.5%) and 22 liver samples (8.6%) of a total of 73 pigeons were positive for *Chlamydiaceae* (Table 4).

Table 4. Samples from different pigeon species tested positive for Chlamydiaceae.

Species	Swabs only (positive/total)	Paired samples: swabs (positive/total)	Paired samples: liver (positive/ total)	Liver only (positive/total)	Total (positive/total)
Feral pigeons	20/142	42/129	18/129	1/47	64/323
Domestic pigeons	4/17	1/15	0/15	0/2	5/34
Common wood pigeon	0/3	1/30	1/30	0/2	2/35
Eurasian collared dove	0/12	2/26	2/26	0/1	2/39
Total	24/174 (13.8%)	46/205 (22.4%)	21/205 (10.2%)	1/52 (1.9 %)	73/431 (16.9%)

Different prevalences related to the geographical origin of the feral pigeons were detected: 15.5% (19/123) pigeons from Berne (4.0% (1/25) from the loft "A", 4.1% (2/49) from the loft "B", 32.7% (16/49) from the loft "C") tested positive for *Chlamydiaceae*, while 17.4% (4/23) of the pigeons from the greater Lucerne area and 27.5% (39/142) of the pigeons from the greater Zurich area had a positive result in the *Chlamydiaceae* qPCR, whereas only 5.7% (2/35) of the feral pigeons from other, generally more rural places in different cantons (Lucerne, Obwalden, Nidwalden, Schwyz, Zug, Aargau, Solothurn, Zurich, Schaffhausen, Basel-Land, Thurgau, St. Gallen) were positive.

For 205 pigeons, paired swab and liver samples were available. Of these paired samples, 22.4% (n = 46) of swab samples but only 10.2% (n = 21) of liver samples were positive for *Chlamydiaceae*. Paired samples of swab and liver from 19 pigeons were positive, 27 pigeons were only positive in the swab sample, while two pigeons tested positive for the liver tissue sample but negative for their respective swab sample. In average, the chlamydial load (*Chlamydia*-%) in swab samples was 10^4 times higher than in the matching liver sample. Only one pigeon had a higher *Chlamydia*-% in the liver sample compared to the associated swab sample (Supplementary Table S2).

4.2 *C. psittaci* is the predominant chlamydial species in Swiss pigeons

All 92 *Chlamydiaceae* positive samples originating from 73 pigeons were further investigated by the Arraymate microarray assay. Of these, 53 samples (57.6%) could be identified as *C. psittaci*, five (5.4%) as *C. avium* and one (1.1%) as a mixed infection of *C. psittaci* and *C. avium*. The remaining 33 (35.9%) samples could not be further identified by microarray

assay and were subjected to the conventional 16S rRNA PCR, as were the six *C. avium*-positive samples of five pigeons for confirmation reasons. Sequencing of PCR products was successful for 13 samples. Of those, five samples from four pigeons (two domestic pigeons and two feral pigeons), four of them previously identified with a single infection with *C. avium,* were confirmed to be positive vor *C. avium*, whereas the other eight samples were identified as *C. psittaci* (eight feral pigeons).

The 25 yet unidentified samples originating from 22 feral pigeons, two domestic pigeons, one common wood pigeon and one Eurasian collared dove, were further investigated with the *C. psittaci ompA* qPCR. All 25 samples were positive for *C. psittaci* (Table 5), including the samples with Ct values > 38 in the *Chlamydiaceae* qPCR.

Table 5. *Chlamydia* species detected in different pigeon species.

Species	*C. psittaci*	*C. avium*	*C. psittaci* + *C. avium*
Feral pigeons	61/323	2/323	1/323
Domestic pigeons	3/34	2/34	0/34
Common wood pigeon	2/35	0/35	0/35
Eurasian collared dove	2/39	0/39	0/39
Total	68/431 (15.8%)	4/431 (0.9%)	1/431 (0.2%)

4.3 Different STs identified in different pigeon populations belong to *ompA* genotype B and E

MLST analysis of twelve selected samples revealed that pigeons from the same city were infected with *C. psittaci* strains from the same or closely related sequence types (ST), while the strains from different cities differed from each other (Figure 2). Additionally, the same ST (ST27) was found in a swab sample (377_T) and the matching liver sample (377_Li) (Table 6).

OmpA typing revealed that nine out of these twelve strains shared 100% sequence identity with the reference *C. psittaci* strain CP3, belonging to *ompA* genotype B. The strains identified as ST26 (194_T) and ST216 (451_T) both shared 99.9% sequence identity with the *C. psittaci* CP3 *ompA* sequence, but also 99.7% and 99.9% sequence identity with the novel genotype B' detected in horse strain Qld/H/Pl (Accession no. MG587894.1), respectively (Table 6). The strain identified as ST213 (394_T) belongs to genotype E, sharing 100% sequence identity with the previously described reference strain MN. Phylogenetic analysis of the *ompA* gene is shown in Figure 3.

All results for each sample are listed in Supplementary Table S3.

Table 6. Results for MLST analysis and *ompA* genotyping for the 12 selected *C. psittaci* samples.

SampleID	Host species	Place	*gat*A	*opp*A	*hflX*	*gid*A	*eno*A	*hem*N	*fum*C	ST	*ompA*
017_T	feral pigeon	Berne	24	14	15	14	13	9	11	55	B
028_T	feral pigeon	Berne	24	14	15	14	13	9	11	55	B
092_T	feral pigeon	Berne	24	14	15	14	13	9	11	55	B
111_T	feral pigeon	Berne	24	14	15	14	13	9	11	55	B
116_T	feral pigeon	Berne	24	14	15	14	13	9	11	55	B
194_T	domestic pigeon	Lucerne	11	14	15	14	13	9	13	26	B“
303_T	feral pigeon	Zurich	11	14	65*	14	13	11	13	212	B
315_T	feral pigeon	Zurich	11	14	65*	14	13	11	13	212	B
377_Li	feral pigeon	Lucerne	11	14	15	14	13	9	11	27	B
377_T	feral pigeon	Lucerne	11	14	15	14	13	9	11	27	B
394_T	feral pigeon	Lucerne	11	14	15	14	13	11	11	213	E
451_T	Eurasian collared dove	Inwil	59**	14	11	14	13	9	13	216	B#

“T”: swab sample; “Li”: liver sample; *: single nucleotide polymorphism (SNP) on position 72; **: SNP on position 141; B“: SNP on position 748 (A → G, synonymous) compared to strain CP3; B#: SNP on positon 466 (A → G, non-synonymous) compared to strain CP3.^

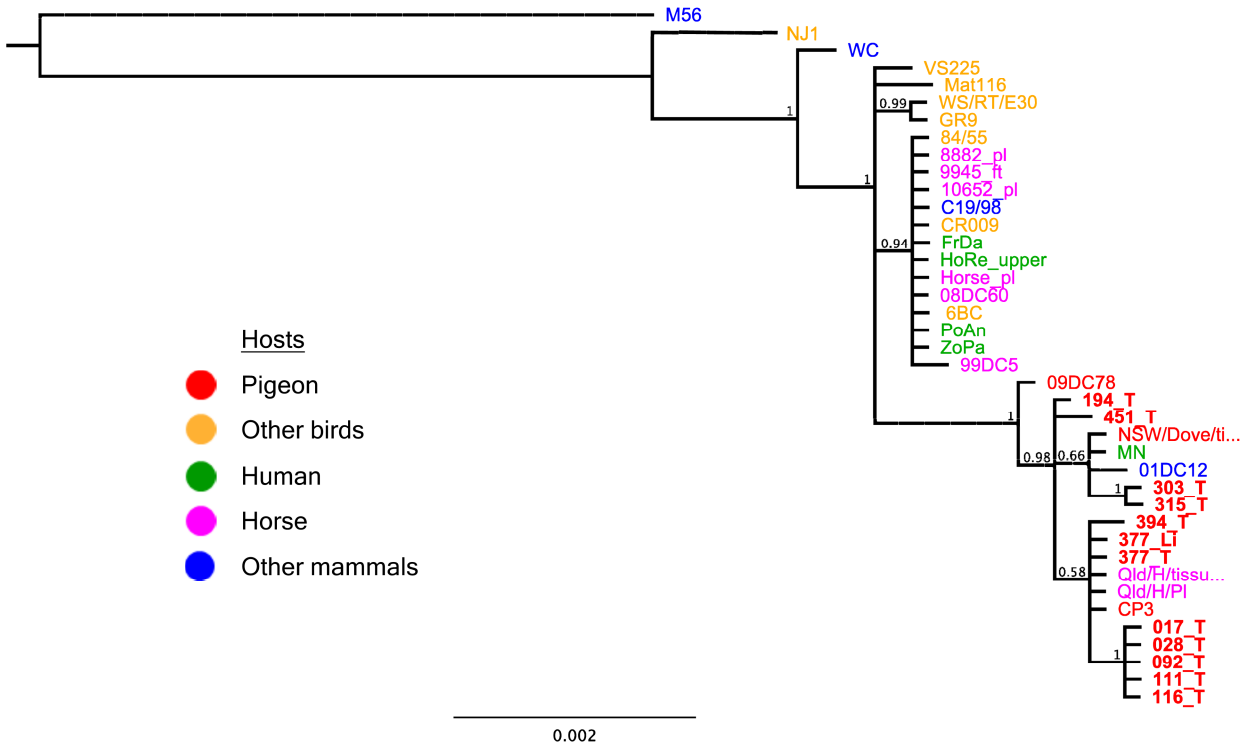

Figure 2. Bayesian phylogenetic tree of concatenated multilocus sequence typing (MLST) sequences from *40 Chlamydia psittaci* strains from avian and mammalian hosts. The host is color-labeled as depicted in the legend. M56 taxa was used as an outgroup. Samples from this study are marked in bold letters. The posterior probability values are displayed on the tree nodes.

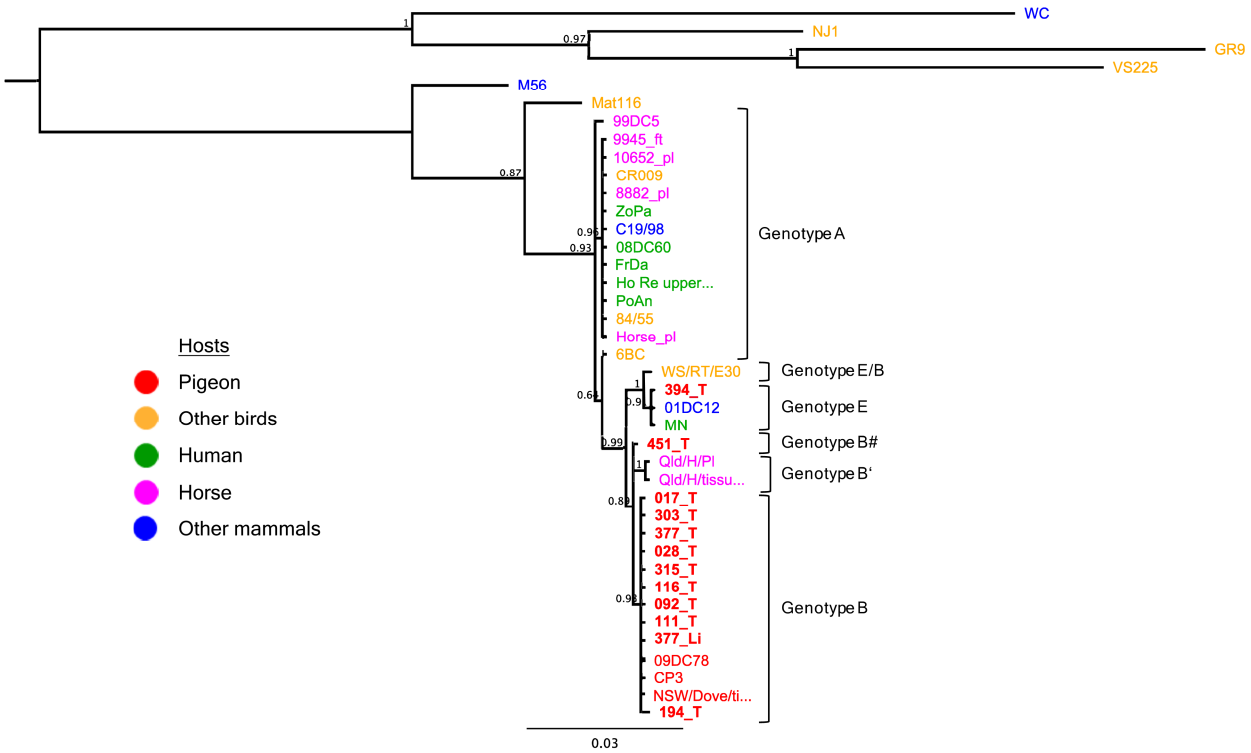

Figure 3. Bayesian phylogenetic tree of *ompA* gene sequences from 40 *Chlamydia psittaci* strains from avian and mammalian hosts. The host is color-labeled as depicted in the legend. M56 taxa was used as an outgroup. Samples from this study are marked in bold letters. The posterior probability values are displayed on the tree nodes.

5. Discussion

5.1 Feral pigeons

The percentage of *Chlamydiaceae*-positive feral pigeons originating from Berne differed between the three city lofts. For two of them (loft "A" and "B"), the prevalence was almost the same, harboring 4.0% and 4.1% positive pigeons, respectively. In the third loft ("C"), however, the prevalence was notably higher, with *Chlamydiaceae* detected in 32.7% of pigeons. Since pigeons of all three lofts were kept under equal conditions, the higher infection rate in the third loft ("C", 32.7%) remains unexplained, though one reason might be the geographical location. Specifically, lofts "A" and "B" are situated in an urban environment while loft "C" is located in the outskirts of Berne in close proximity to a forest. Samples taken from five feral pigeons originating from these three different lofts were all typed as ST55 by MLST and genotype B by ompA genotyping, the most common genotype found in pigeons (Magnino et al. 2009; Dolz et al. 2013; Sariya et al. 2015; Wang et al. 2018) which indicates that prevalence differences are not related to a specific MLST or *ompA* type.

Feral pigeons from Lucerne have previously been tested for the presence of *Chlamydiaceae* DNA in 2007, resulting in 3.3% (2/60) positive results (Zweifel et al. 2009). In the present study, 17.4% (4/23) of feral pigeons from the greater Lucerne area tested positive for *Chlamydiaceae*. Since the herein tested pigeons from the greater Lucerne area had been admitted to a wildlife hospital, sampled animals predominantly suffered from trauma or disease, which could have induced or increased chlamydial shedding due to stress (Shewen 1980). The *C. psittaci* strains detected in the swab (377_T) and the matching liver sample (377_Li) from a single pigeon were identical according to MLST analysis (ST27). Based on *ompA* sequencing, this strain also belongs to genotype B (Figure 3). Interestingly, the strain from the second feral pigeon (394_T) from the greater Lucerne area belongs to a different but closely related ST (ST213; Figure 2) and to *ompA* genotype E (Figure 3), sharing 100% sequence identity with the previously described *ompA* genotype E reference strain MN, isolated from a human in 1934 in the USA (Francis and Magill 1938). This genotype can be frequently found in pigeons (Magnino et al. 2009) and has been detected in several avian species from Europe and Asia (Dickx et al. 2013; van Loock et al. 2005; Jeong et al. 2017; Donati et al. 2015; Beckmann et al. 2014).

The prevalence of *Chlamydiaceae*-positive pigeons in Zurich was 27.4% (39/142) in contrast to the previous study by Zweifel et al. (2009), where ten out of twenty-four (42.7%) pigeons from Zurich tested positive for *Chlamydiaceae*. It is unclear whether the amount of infected birds decreased over time or whether the difference is biased due to different sample sizes. MLST data for two pigeons from Zurich (303_T, 315_T) were obtained, showing the same, newly identified *C. psittaci* ST 212 and *ompA* genotype B in both pigeons.

Since the prevalence seemed to be higher in the city of Zurich (27.4%) compared to other Swiss cities (Berne (15.4%), greater Lucerne area (17.4%)), which implemented different population management programs, the type of program might influence urban *Chlamydiaceae*

epidemiology. The two population management programs in Berne and Lucerne were more effective than culling to achieve a smaller and healthier pigeon population. It was shown that culling, as performed in Zurich, only resulted in a temporary population size decrease; most likely due to the high compensatory potential of pigeons (Giunchi et al. 2012). Additionally, the continuous extraction of animals by culling might result in an increased contact rate between individual pigeons due to the frequent restructuring of the population (Sol and Senar 1995), thus leading to a potential increase of disease transmission events within the population.

Two (5.7%) of the thirty-five feral pigeons from various other, rather rural places in the Cantons Lucerne, Obwalden, Nidwalden, Schwyz, Zug, Aargau, Solothurn, Zurich, Schaffhausen, Basel-Land, Thurgau, St. Gallen, were positive for *C. psittaci*. The prevalence in feral pigeons originating from rural geographical locations is comparable with the prevalence detected in other wild pigeon species throughout Switzerland in the present study. In small villages and on farmland, the population density of feral pigeons is much lower than in urban areas and is comparable to that of common wood pigeons throughout Switzerland (Knaus 2018), which might explain the lower *Chlamydiaceae* prevalence in rural pigeon populations when compared to feral pigeons from cities.

Data from several studies (Sol and Senar 1995; Giunchi et al. 2012) suggest that the exchange between different pigeon populations is limited, indicating high population stability related to composition and size. The result from MLST analysis supports this data, showing the same or very closely related *C. psittaci* strains infecting individuals from the same population. Therefore, it can be assumed that direct pathogen transmission between different populations is occurring only infrequently.

The prevalence of *C. psittaci* in feral pigeons varies widely between different European countries or cities, e.g. from 2.4% in Utrecht, the Netherlands (Burt et al. 2018) to 50% in Vinica, Republic of North Macedonia (Magnino et al. 2009), and may even vary from year to year (Sachse et al. 2012). The prevalences seen in the greater Lucerne area and Berne are comparable to those of other cities in Europe (Sachse et al. 2012; Čechová et al. 2016; Magnino et al. 2009). Zurich on the other hand, shows one of the highest prevalences throughout Europe (Magnino et al. 2009).

5.2 Domestic pigeons

14.7% (5/34) of Swiss domestic pigeons were positive for *Chlamydiaceae* which is comparable to prevalences reported in domestic pigeons elsewhere in Europe such as Slovenia with a prevalence of 16% (Dovč et al. 2016) and Germany with 12.8-42.6% (Teske et al. 2013). Since *C. psittaci* is a zoonotic agent, domestic pigeons pose a potential risk to their owners as the incidence of transmission to pigeon holders is increased during contact with contaminated dust in lofts and is far more frequent than during contact with feral pigeons.

The *C. psittaci* strain from a domestic pigeon analyzed in the present study (194_T) belongs to the ST26 (Figure 2), also previously found in feral pigeons from Italy (Pannekoek et al. 2010). Its *ompA* gene showed a SNP on position 748 (A → G) compared to the sequence of the strain CP3 (genotype B, Figure 3, Table 6). Due to high sequence similarity, the strain was clustered in the genotype B clade.

Domestic pigeons, especially homing pigeons, may pose an additional risk for disease spread, particularly when taking part in contests. As shown in several recently published studies, clinically healthy racing pigeons in Slovenia and Germany showed prevalences ranging from 12.8% up to 42.6% (Dovč et al. 2016; Teske et al. 2013). During a contest, these pigeons might suffer from a higher stress level and shedding of *Chlamydia* might be activated or increased. Pathogens might be spread over huge distances during pigeon races, some of them covering up to 600 miles.

5.3 Eurasian collared doves

Two (5.1%) of the thirty-nine Eurasian collared doves were positive for *Chlamydiaceae*. In a recent study investigating urban collared dove populations from Italy, 61% (46/76) were positive for *C. psittaci* and showed a higher prevalence than feral pigeons (14-42%) (Donati et al. 2015). Since the birds of the present study all originated from different locations, it seems likely that they belong to different colonies. More individuals from the same colony need to be tested to appropriately compare infection rates of Eurasian collared doves in Switzerland to those in Italy.

Bracewell and Bevan (1986) detected antibodies (direct complement-fixation test) against *Chlamydiaceae* in serum samples of 19/37 (51.4%) Eurasian collared doves in the UK between 1974 and 1983. However, antibody detection does not prove the presence or shedding of *Chlamydiae* and cannot differentiate between a recent or previous infection. Therefore, the percentage of seropositive animals in a population is usually higher compared to antigen- or DNA-positive birds. For example, Haag-Wackernagel et al. (2006) found a seroprevalence (antibody-ELISA, Ridascreen *Chlamydophila psittaci*, *R*-Biopharm, Germany) of 56% in feral pigeons from Lucerne, however, only 2% were actively shedding *C. psittaci* (isolation in ovoculture).

In the present study, MLST was performed on one sample from a Eurasian collared dove (451_T) and yielded a new ST (ST216) that was closely related to the strain detected in the domestic pigeon "194_T" from a nearby location. The *ompA* gene showed a non-synonymous mutation compared to genotype B and the recently denoted genotype B' from an Australian dove (Jelocnik et al. 2018), and thus was denoted genotype B#. In studies from Italy and the UK, Eurasian collared doves were infected with genotype E (Donati et al. 2015; Beckmann et al. 2014).

5.4 Common wood pigeons

Two (5.7%) of the thirty-five common wood pigeons were positive for *C. psittaci*. MLST and *ompA* typing could not be performed due to the low amount of chlamydial DNA content of the samples (Ct value 33.9 and 35.7; *Chlamydia*-% $3.71*10^{-5}$ and $1.18*10^{-6}$, respectively).

Sharples et al. (2009) detected a similar prevalence of 4% (1/25; *ompB* PCR) for *C. psittaci* in common wood pigeons tested in the UK.

5.5 Public health concerns

Not only feral and domestic pigeons can pose a risk to humans, but also wild living species such as as the common wood pigeon or Eurasian collared dove may represent a potential hazard. Due to intermittent shedding, even clinically healthy pigeons or pigeons with a single negative result in the PCR might still be a source of infection (Takahashi et al. 1988; West 2011). A major risk factor identified for human *C. psittaci* infection was unprotected daily contact to domestic pigeons (i.e. contact to feather dust and fecal matter) (Harkinezhad et al. 2009b).

Notably, all members of the long-standing crew from the rehabilitation center of the Swiss Ornithological Institute, from where many of the *Chlamydia*-positive pigeons in this study derived, routinely wear personal protective equipment (gloves, goggles, protective clothing, face mask) and all tested negative for antibodies against *C. psittaci* in a voluntary occupational medicine scheme in 2016/17. The test (micro-immunofluorescent assay IgA and IgG) was performed by the Department of Medical Microbiology, University of Zurich, following the protocol used by Zbinden et al. (1996) and using the test kits “Chlamydia MIF IgA” and “Chlamydia MIF IgG” (Focus, Cypress, CA). It can therefore be deduced that the above mentioned protective measures are useful.

The present study shows that wild pigeons also occasionally carry *C. avium* (n = 5), with one pigeon additionally being positive for *C. psittaci*. So far, *C. avium* has been found in pigeons in the Netherlands, where the prevalence of *C. avium* (36.6%; 20.0 %) in feral pigeons was higher than the prevalence of *C. psittaci* (2.4%; 7.5%). Furthermore, *C. avium* was identified in pigeons from France, Germany, Italy, and the Netherlands (Sachse et al. 2014; Burt et al. 2018). In Germany, co-infections of *C. avium* and *C. psittaci* were detected in two young pigeons, both showing respiratory symptoms (Sachse et al. 2014). Szymańska-Czerwińska and Niemczuk (2016) suggest that co-infection with *C. psittaci* and *C. avium* may cause clinical symptoms in birds. However, the pigeon tested positive for both said *Chlamydia* species in the present study was euthanized due to an open metacarpal fracture. Apart from that, no clinical symptoms were observed. Initially, *C. avium* has been found mainly in pigeons, additionally recent studies reported *C. avium* infections in a parrot in Germany and a mallard duck in Poland (Szymańska-Czerwińska et al. 2017; Sachse et al. 2014). The zoonotic potential of *C. avium* is still unclear.

As expected, most *C. psittaci*-positive samples that were further investigated by *ompA* sequencing belonged to genotype B, the genotype responsible for the majority of the

C. psittaci infections in pigeons and thought to be endemic in the European pigeon populations (Magnino et al. 2009). One feral pigeon (394_T) was infected by a *C. psittaci* strain belonging to genotype E, which is frequently found in pigeons worldwide and has been detected in several other avian species (Magnino et al. 2009; Jeong et al. 2017). This genotype has been associated with several outbreaks in ducks and turkeys as well as fatal cases of chlamydiosis in ratites (Harkinezhad et al. 2009a). In humans, both genotypes are considered to be less pathogenic than the closely related genotype A, predominantly found in psittacine birds (Rehn et al. 2013; Wallensten et al. 2014; Branley et al. 2016; Boeck et al. 2016). Especially strains from genotype A belonging to the subtype 6BC are considered particularly pathogenic due to a more invasive behavior and a shorter developmental cycle (Read et al. 2013). However, all genotypes of *C. psittaci* are considered zoonotic.

In conclusion, of the 431 investigated individuals, feral pigeons (19.8%) were most commonlly infected with *Chlamydiaceae*, followed by domestic pigeons. *Chlamydia psittaci* was the most common *Chlamydia* species detected and the presence of *C. avium* in Switzerland was reported for the first time.

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7. Supplementary material

Supplementary Table S1. *Chlamydia psittaci* strains shown in Fig 2 + 3. These strains are either *Chlamydia psittaci* -reference strains or were isolated from horse abortions, humans showing severe respiratory symptoms and from birds originating from Europe and Australia. Additionally, strains isolated from other mammals from Germany are listed.

Strain	Host	ompA genotype	ST	Country of origin	GeneBank
84/55	Amazon	A-8455	24	Germany	CP003790.1
A-6BC	Parakeet	A-6BC	24	USA	CP002549.1
CP3	Pigeon	B	27	USA	NC_018625.1
GR9	Mallard	C	28	Germany	NC_018620.1
NJ1	Turkey	D	43	USA	NC_018626.1
MN	Human	E	35	USA	NC_018627.1
VS225	Parakeet	F	204	USA	CP003793.1
WS/RT/E30	Mallard	E/B	28	Germany	NC_018622.1
M56	Muskrat	M56	31	Canada	NC_018623.1
WC	Cattle	WC	32		NC_018624.1
Mat116	Chestnut fronted macaw	Mat116	208	Japan	CP002744.1
01DC12	Pig	E	56	Germany	
08DC60	Human	A-8455	24	Germany	
09DC78	Pigeon	B	47	Germany	
10652_pl	Horse	A-8455	24	Australia	
8882_pl	Horse	A-8455	24	Australia	
9945_ft	Horse	A-8455	24	Australia	
99DC5	Horse	A	218	Germany	
C19/98	Sheep	A-8455	24	Germany	
CR009	Crimson rosella	A-8455	24	Australia	
FrDa	Human	A-8455	24	Australia	
HoRe_upper	Human	A-8455	24	Australia	
Horse_pl	Horse	A-8455	24	Australia	
NSW/Dove/tissue	Pigeon	B	35	Australia	
PoAn	Human	A-8455	24	Australia	
Qld/H/Pl	Horse	B’	27	Australia	
Qld/H/tiddue	Horse	B’	27	Australia	
ZoPa	Human	A-8455	24	Australia	

Supplementary Table S2. Percentage of Chlamydia DNA out of total DNA (Chlamydia-%) from paired swab and liver samples.

PigeonID	*Chlamydia*-%-swab [%] (pigeonID_T)	*Chlamydia*-%-liver [%] (pigeonID_Li)	ratio of *Chlamydia*-% (swab : liver)
193	$1.11 * 10^{-2}$	$4.37 * 10^{-5}$	254.9
251	$3.43 * 10^{-1}$	$1.65 * 10^{-5}$	20776.6
266	$1.82 * 10^{-4}$	$3.45 * 10^{-5}$	5.3
268	$9.69 * 10^{-5}$	$5.30 * 10^{-6}$	18.3
273	$2.92 * 10^{-3}$	$4.66 * 10^{-4}$	6.3
281	$1.78 * 10^{-2}$	$1.48 * 10^{-4}$	120.5
289	$3.32 * 10^{-5}$	$7.18 * 10^{-6}$	4.6
295	$5.13 * 10^{-3}$	$1.17 * 10^{-4}$	43.7
301	$3.60 * 10^{-1}$	$4.45 * 10^{-6}$	80923.6
303	$1.34 * 10^{0}$	$1.77 * 10^{-5}$	78851.0
304	$9.19 * 10^{-1}$	$1.48 * 10^{-4}$	6228.6
306	$1.45 * 10^{-2}$	$5.80 * 10^{-6}$	2494.8
308	$9.19 * 10^{-2}$	$6.01 * 10^{-5}$	1528.4
310	$2.47 * 10^{-4}$	$5.44 * 10^{-7}$	454.8
334	$2.47 * 10^{-2}$	$3.51 * 10^{-4}$	70.5
369	$1.69 * 10^{-5}$	$4.92 * 10^{-8}$	344.6
377	$6.63 * 10^{-2}$	$7.13 * 10^{-2}$	0.9
423	$2.87 * 10^{-2}$	$1.11 * 10^{-3}$	25.9
451	$6.02 * 10^{-1}$	$8.62 * 10^{-5}$	6982.0

Supplementary Table S3. Raw data for each pigeon and its available samples.

Sample no.	Pigeon_ID	Species	Place of Origin (Canton), pigeon loft	Material	*Chlamydiaceae* real-time (Ø Ct value)	*Chlamydia*-% [%]	DNA microarray assay	16S rRNA PCR and sequencing (Query cover [%]/ Ident [%])	*C. psittaci* real-time PCR (Ø Ct value)	MLST Sequence type	*Omp*A genotype
001_T	vowa11002	domestic pigeon	Alpnach (OW)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
001_Li	vowa11002	domestic pigeon	Alpnach (OW)	liver	n.a.						
002_T	vowa10995	feral pigeon	Emmenbruecke (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
002_Li	vowa10995	feral pigeon	Emmenbruecke (LU)	liver	n.a.						
003_T	vowa10930	feral pigeon	Emmen (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
003_Li	vowa10930	feral pigeon	Emmen (LU)	liver	n.a.						
004_T	vowa10958	feral pigeon	Hochdorf (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
004_Li	vowa10958	feral pigeon	Hochdorf (LU)	liver	n.a.						
005_T	vowa11032	feral pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
005_Li	vowa11032	feral pigeon	Lucerne (LU)	liver	n.a.						
006_T	vowa10878	feral pigeon	Ebikon (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
006_Li	vowa10878	feral pigeon	Ebikon (LU)	liver	n.a.						
007_T	vowa10830	feral pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
007_Li	vowa10830	feral pigeon	Lucerne (LU)	liver	n.a.						
011_T	757	feral pigeon	Berne (BE), "C"	swab	pos. (35.4)	7.28E-05	n.i.	C. psittaci (HF545614.1) (100/99)	n.d.	n.d.	n.d.
011_Li	757	feral pigeon	Berne (BE), "C"	liver	n.a.						
012_T	692	feral pigeon	Berne (BE), "C"	swab	pos. (27.1)	3.53E-02	C. psittaci	n.d.	n.d.	n.d.	n.d.

012_Li	692	feral pigeon	Berne (BE), "C"	liver	n.a.						
013_T	758	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
013_Li	758	feral pigeon	Berne (BE), "C"	liver	n.a.						
014_T	206	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
014_Li	206	feral pigeon	Berne (BE), "B"	liver	n.a.						
015_T	227	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
015_Li	227	feral pigeon	Berne (BE), "B"	liver	n.a.						
016_T	675	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
016_Li	675	feral pigeon	Berne (BE), "B"	liver	n.a.						
017_T	760	feral pigeon	Berne (BE), "B"	swab	pos. (21.4)	2.07E+00	C. psittaci	n.d.	n.d.	55	B
017_Li	760	feral pigeon	Berne (BE), "B"	liver	n.a.						
018_T	299	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
018_Li	299	feral pigeon	Berne (BE), "B"	liver	n.a.						
019_T	738	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
019_Li	738	feral pigeon	Berne (BE), "B"	liver	n.a.						
020_T	610	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
020_Li	610	feral pigeon	Berne (BE), "B"	liver	n.a.						
021_T	165	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
021_Li	165	feral pigeon	Berne (BE), "B"	liver	n.a.						
022_T	123	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

022_Li	123	feral pigeon	Berne (BE), "B"	liver	n.a.						
023_T	705	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
023_Li	705	feral pigeon	Berne (BE), "B"	liver	n.a.						
024_T	659	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
024_Li	659	feral pigeon	Berne (BE), "B"	liver	n.a.						
025_T	88	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
025_Li	88	feral pigeon	Berne (BE), "B"	liver	n.a.						
026_T	734	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
026_Li	734	feral pigeon	Berne (BE), "B"	liver	n.a.						
027_T	322	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
027_Li	322	feral pigeon	Berne (BE), "B"	liver	n.a.						
028_T	ringless 1	feral pigeon	Berne (BE), "B"	swab	pos. (32.7)	5.56E-04	n.i.	C. psittaci (HF545614.1) (100/100)	n.d.	55	B
028_Li	ringless 1	feral pigeon	Berne (BE), "B"	liver	n.a.						
029_T	700	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
029_Li	700	feral pigeon	Berne (BE), "B"	liver	n.a.						
030_T	394	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
030_Li	394	feral pigeon	Berne (BE), "B"	liver	n.a.						
031_T	655	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
031_Li	655	feral pigeon	Berne (BE), "B"	liver	n.a.						
032_T	706	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

032_Li	706	feral pigeon	Berne (BE), "B"	liver	n.a.						
033_T	309	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
033_Li	309	feral pigeon	Berne (BE), "B"	liver	n.a.						
034_T	223	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
034_Li	223	feral pigeon	Berne (BE), "B"	liver	n.a.						
035_T	287	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
035_Li	287	feral pigeon	Berne (BE), "B"	liver	n.a.						
036_T	747	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
036_Li	747	feral pigeon	Berne (BE), "B"	liver	n.a.						
037_T	127	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
037_Li	127	feral pigeon	Berne (BE), "B"	liver	n.a.						
038_T	551	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
038_Li	551	feral pigeon	Berne (BE), "B"	liver	n.a.						
039_T	709	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
039_Li	709	feral pigeon	Berne (BE), "B"	liver	n.a.						
040_T	731	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
040_Li	731	feral pigeon	Berne (BE), "B"	liver	n.a.						
041_T	645	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
041_Li	645	feral pigeon	Berne (BE), "B"	liver	n.a.						
042_T	749	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

042_Li	749	feral pigeon	Berne (BE), "B"	liver	n.a.						
043_T	713	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
043_Li	713	feral pigeon	Berne (BE), "B"	liver	n.a.						
044_T	579	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
044_Li	579	feral pigeon	Berne (BE), "B"	liver	n.a.						
045_T	212	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
045_Li	212	feral pigeon	Berne (BE), "B"	liver	n.a.						
046_T	728	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
046_Li	728	feral pigeon	Berne (BE), "B"	liver	n.a.						
047_T	390	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
047_Li	390	feral pigeon	Berne (BE), "B"	liver	n.a.						
048_T	339	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
048_Li	339	feral pigeon	Berne (BE), "B"	liver	n.a.						
049_T	717	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
049_Li	717	feral pigeon	Berne (BE), "B"	liver	n.a.						
050_T	137	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
050_Li	137	feral pigeon	Berne (BE), "B"	liver	n.a.						
051_T	548	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
051_Li	548	feral pigeon	Berne (BE), "B"	liver	n.a.						
052_T	707	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

052_Li	707	feral pigeon	Berne (BE), "B"	liver	n.a.						
053_T	481	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
053_Li	481	feral pigeon	Berne (BE), "B"	liver	n.a.						
055_T	744	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
055_Li	744	feral pigeon	Berne (BE), "B"	liver	n.a.						
056_T	726	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
056_Li	726	feral pigeon	Berne (BE), "B"	liver	n.a.						
057_T	614	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
057_Li	614	feral pigeon	Berne (BE), "B"	liver	n.a.						
058_T	661	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
058_Li	661	feral pigeon	Berne (BE), "B"	liver	n.a.						
059_T	708	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
059_Li	708	feral pigeon	Berne (BE), "B"	liver	n.a.						
060_T	735	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
060_Li	735	feral pigeon	Berne (BE), "B"	liver	n.a.						
061_T	727	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
061_Li	727	feral pigeon	Berne (BE), "B"	liver	n.a.						
062_T	729	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
062_Li	729	feral pigeon	Berne (BE), "B"	liver	n.a.						
063_T	773	feral pigeon	Berne (BE), "B"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

063_Li	773	feral pigeon	Berne (BE), "B"	liver	n.a.						
064_T	692	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
064_Li	692	feral pigeon	Berne (BE), "A"	liver	n.a.						
065_T	791	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
065_Li	791	feral pigeon	Berne (BE), "A"	liver	n.a.						
066_T	799	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
066_Li	799	feral pigeon	Berne (BE), "A"	liver	n.a.						
067_T	766	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
067_Li	766	feral pigeon	Berne (BE), "A"	liver	n.a.						
068_T	764	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
068_Li	764	feral pigeon	Berne (BE), "A"	liver	n.a.						
069_T	737	feral pigeon	Berne (BE), "C"	swab	pos. (35.5)	2.37E-04	n.i.	C. psittaci (HF545614.1) (99/100)	n.d.	n.d.	n.d.
069_Li	737	feral pigeon	Berne (BE), "C"	liver	n.a.						
070_T	733	feral pigeon	Berne (BE), "C"	swab	pos. (29.8)	1.36E-03	C. psittaci	n.d.	n.d.	n.d.	n.d.
070_Li	733	feral pigeon	Berne (BE), "C"	liver	n.a.						
071_T	739	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
071_Li	739	feral pigeon	Berne (BE), "C"	liver	n.a.						
072_T	745	feral pigeon	Berne (BE), "C"	swab	pos. (25.2)	1.85E-04	C. psittaci	n.d.	n.d.	n.d.	n.d.
072_Li	745	feral pigeon	Berne (BE), "C"	liver	n.a.						
073_T	621	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

073_Li	621	feral pigeon	Berne (BE), "C"	liver	n.a.						
074_T	674	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
074_Li	674	feral pigeon	Berne (BE), "C"	liver	n.a.						
075_T	725	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
075_Li	725	feral pigeon	Berne (BE), "C"	liver	n.a.						
076_T	794	feral pigeon	Berne (BE), "C"	swab	pos. (33.0)	2.11E-03	n.i.	C. psittaci (HF545614.1) (99/100)	n.d.	n.d.	n.d.
076_Li	794	feral pigeon	Berne (BE), "C"	liver	n.a.						
077_T	712	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
077_Li	712	feral pigeon	Berne (BE), "C"	liver	n.a.						
078_T	355	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
078_Li	355	feral pigeon	Berne (BE), "C"	liver	n.a.						
079_T	730	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
079_Li	730	feral pigeon	Berne (BE), "C"	liver	n.a.						
080_T	732	feral pigeon	Berne (BE), "C"	swab	pos. (34.8)	2.20E-04	n.i.	n.i.	pos. (34.0)	n.d.	n.d.
080_Li	732	feral pigeon	Berne (BE), "C"	liver	n.a.						
081_T	607	feral pigeon	Berne (BE), "C"	swab	pos. (31.3)	1.01E-02	n.i.	C. psittaci (HF545614.1) (99/100)	n.d.	n.d.	n.d.
081_Li	607	feral pigeon	Berne (BE), "C"	liver	n.a.						
082_T	746	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
082_Li	746	feral pigeon	Berne (BE), "C"	liver	n.a.						
083_T	648	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

083_Li	648	feral pigeon	Berne (BE), "C"	liver	n.a.						
084_T	701	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
084_Li	701	feral pigeon	Berne (BE), "C"	liver	n.a.						
085_T	446	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
085_Li	446	feral pigeon	Berne (BE), "C"	liver	n.a.						
086_T	693	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
086_Li	693	feral pigeon	Berne (BE), "C"	liver	n.a.						
087_T	372	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
087_Li	372	feral pigeon	Berne (BE), "C"	liver	n.a.						
088_T	38	feral pigeon	Berne (BE), "C"	swab	pos. (33.9)	3.01E-04	n.i.	n.i.	pos. (32.8)	n.d.	n.d.
088_Li	38	feral pigeon	Berne (BE), "C"	liver	n.a.						
089_T	748	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
089_Li	748	feral pigeon	Berne (BE), "C"	liver	n.a.						
090_T	736	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
090_Li	736	feral pigeon	Berne (BE), "C"	liver	n.a.						
091_T	722	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
091_Li	722	feral pigeon	Berne (BE), "C"	liver	n.a.						
092_T	703	feral pigeon	Berne (BE), "C"	swab	pos. (24.9)	3.02E-01	C. psittaci	n.d.	n.d.	55	B
092_Li	703	feral pigeon	Berne (BE), "C"	liver	n.a.						
093_T	711	feral pigeon	Berne (BE), "C"	swab	pos. (34.0)	1.33E-03	n.i.	C. psittaci (HF545614.1) (99/100)	n.d.	n.d.	n.d.

093_Li	711	feral pigeon	Berne (BE), "C"	liver	n.a.						
094_T	587	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
094_Li	587	feral pigeon	Berne (BE), "C"	liver	n.a.						
095_T	718	feral pigeon	Berne (BE), "C"	swab	pos. (36.5)	1.63E-04	n.i.	n.i.	pos. (34.6)	n.d.	n.d.
095_Li	718	feral pigeon	Berne (BE), "C"	liver	n.a.						
096_T	721	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
096_Li	721	feral pigeon	Berne (BE), "C"	liver	n.a.						
097_T	740	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
097_Li	740	feral pigeon	Berne (BE), "C"	liver	n.a.						
098_T	479	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
098_Li	479	feral pigeon	Berne (BE), "C"	liver	n.a.						
099_T	743	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
099_Li	743	feral pigeon	Berne (BE), "C"	liver	n.a.						
100_T	714	feral pigeon	Berne (BE), "C"	swab	pos. (34.6)	2.18E-04	n.i.	C. psittaci (HF545614.1) (100/99)	n.d.	n.d.	n.d.
100_Li	714	feral pigeon	Berne (BE), "C"	liver	n.a.						
101_T	697	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
101_Li	697	feral pigeon	Berne (BE), "C"	liver	n.a.						
102_T	720	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
102_Li	720	feral pigeon	Berne (BE), "C"	liver	n.a.						
103_T	92	feral pigeon	Berne (BE), "C"	swab	pos. (29.6)	4.89E-02	C. psittaci	n.d.	n.d.	n.d.	n.d.

103_Li	92	feral pigeon	Berne (BE), "C"	liver	n.a.						
104_T	317	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
104_Li	317	feral pigeon	Berne (BE), "C"	liver	n.a.						
105_T	715	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
105_Li	715	feral pigeon	Berne (BE), "C"	liver	n.a.						
106_T	273	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
106_Li	273	feral pigeon	Berne (BE), "C"	liver	n.a.						
107_T	407	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
107_Li	407	feral pigeon	Berne (BE), "C"	liver	n.a.						
108_T	719	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
108_Li	719	feral pigeon	Berne (BE), "C"	liver	n.a.						
109_T	43	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
109_Li	43	feral pigeon	Berne (BE), "C"	liver	n.a.						
110_T	210	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
110_Li	210	feral pigeon	Berne (BE), "C"	liver	n.a.						
111_T	774	feral pigeon	Berne (BE), "C"	swab	pos. (24.4)	2.97E-01	C. psittaci	n.d.	n.d.	55	B
111_Li	774	feral pigeon	Berne (BE), "C"	liver	n.a.						
112_T	281	feral pigeon	Berne (BE), "C"	swab	pos. (29.4)	3.04E-03	C. psittaci	n.d.	n.d.	n.d.	n.d.
112_Li	281	feral pigeon	Berne (BE), "C"	liver	n.a.						
113_T	649	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

113_Li	649	feral pigeon	Berne (BE), "C"	liver	n.a.						
114_T	586	feral pigeon	Berne (BE), "C"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
114_Li	586	feral pigeon	Berne (BE), "C"	liver	n.a.						
115_T	788	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
115_Li	788	feral pigeon	Berne (BE), "A"	liver	n.a.						
116_T	orange 2	feral pigeon	Berne (BE), "A"	swab	pos. (32.5)	3.92E-03	C. psittaci	n.d.	n.d.	55	B
116_Li	orange 2	feral pigeon	Berne (BE), "A"	liver	n.a.						
117_T	685	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
117_Li	685	feral pigeon	Berne (BE), "A"	liver	n.a.						
118_T	767	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
118_Li	767	feral pigeon	Berne (BE), "A"	liver	n.a.						
119_T	761	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
119_Li	761	feral pigeon	Berne (BE), "A"	liver	n.a.						
120_T	768	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
120_Li	768	feral pigeon	Berne (BE), "A"	liver	n.a.						
121_T	16	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
121_Li	16	feral pigeon	Berne (BE), "A"	liver	n.a.						
122_T	497	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
122_Li	497	feral pigeon	Berne (BE), "A"	liver	n.a.						
123_T	775	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

123_Li	775	feral pigeon	Berne (BE), "A"	liver	n.a.						
124_T	67	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
124_Li	67	feral pigeon	Berne (BE), "A"	liver	n.a.						
125_T	four colors	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
125_Li	four colors	feral pigeon	Berne (BE), "A"	liver	n.a.						
126_T	785	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
126_Li	785	feral pigeon	Berne (BE), "A"	liver	n.a.						
127_T	763	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
127_Li	763	feral pigeon	Berne (BE), "A"	liver	n.a.						
128_T	265	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
128_Li	265	feral pigeon	Berne (BE), "A"	liver	n.a.						
130_T	759	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
130_Li	759	feral pigeon	Berne (BE), "A"	liver	n.a.						
131_T	770	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
131_Li	770	feral pigeon	Berne (BE), "A"	liver	n.a.						
132_T	800	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
132_Li	800	feral pigeon	Berne (BE), "A"	liver	n.a.						
133_T	293	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
133_Li	293	feral pigeon	Berne (BE), "A"	liver	n.a.						
134_T	751	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

134_Li	751	feral pigeon	Berne (BE), "A"	liver	n.a.						
135_T	782	feral pigeon	Berne (BE), "A"	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
135_Li	782	feral pigeon	Berne (BE), "A"	liver	n.a.						
148_T	vowa10814	domestic pigeon	St. Urban (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
148_Li	vowa10814	domestic pigeon	St. Urban (LU)	liver	n.a.						
149_T	vowa11106	domestic pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
149_Li	vowa11106	domestic pigeon	Lucerne (LU)	liver	n.a.						
150_T	vowa11225	common wood pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
150_Li	vowa11225	common wood pigeon	Lucerne (LU)	liver	n.a.						
151_T	vowa11414	feral pigeon	Kriens (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
151_Li	vowa11414	feral pigeon	Kriens (LU)	liver	n.a.						
152_T	vowa11382	feral pigeon	Aarburg (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
152_Li	vowa11382	feral pigeon	Aarburg (AG)	liver	n.a.						
153_T	vowa11630	Eurasian collared dove	Winikon (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
153_Li	vowa11630	Eurasian collared dove	Winikon (LU)	liver	n.a.						
154_T	vowa11655	Eurasian collared dove	Dagmersellen (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
154_Li	vowa11655	Eurasian collared dove	Dagmersellen (LU)	liver	n.a.						
157_T	vowa11672	common wood pigeon	Emmenbruecke (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
157_Li	vowa11672	common wood pigeon	Emmenbruecke (LU)	liver	n.a.						
158_T	vowa11524	feral pigeon	Olten (SO)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

158_Li	vowa11524	feral pigeon	Olten (SO)	liver	n.a.						
159_T	vowa11603	feral pigeon	Rothenburg (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
159_Li	vowa11603	feral pigeon	Rothenburg (LU)	liver	n.a.						
160_T	vowa11733	Eurasian collared dove	Thayngen (SH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
160_Li	vowa11733	Eurasian collared dove	Thayngen (SH)	liver	n.a.						
162_T	vowa11201	domestic pigeon	Sursee (LU)	swab	pos. (33.3)	3.50E-05	n.i.	n.i.	pos. (38.7)	n.d.	n.d.
162_Li	vowa11201	domestic pigeon	Sursee (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
163_T	vowa10916	feral pigeon	Seengen (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
163_Li	vowa10916	feral pigeon	Seengen (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
164_T	vowa10124	domestic pigeon	Buchrain (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
164_Li	vowa10124	domestic pigeon	Buchrain (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
165_T	vowa10718	common wood pigeon	Sempach (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
165_Li	vowa10718	common wood pigeon	Sempach (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
166_T	vowa11428	Eurasian collared dove	Unterentfelden (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
166_Li	vowa11428	Eurasian collared dove	Unterentfelden (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
167_t	vowa1754	Eurasian collared dove	Schötz (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
167_Li	vowa1754	Eurasian collared dove	Schötz (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
168_T	vowa11720	common wood pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
168_Li	vowa11720	common wood pigeon	Lucerne (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
169_T	vowa11708	domestic pigeon	Sursee (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

169_Li	vowa11708	domestic pigeon	Sursee (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
170_T	vowa11012	common wood pigeon	Kriens (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
170_Li	vowa11012	common wood pigeon	Kriens (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
171_T	vowa11154	common wood pigeon	Emmenbruecke (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
171_Li	vowa11154	common wood pigeon	Emmenbruecke (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
172_T	vowa11154	Eurasian collared dove	Ermensee (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
172_Li	vowa11154	Eurasian collared dove	Ermensee (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
173_T	vowa10856	common wood pigeon	Sins (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
173_Li	vowa10856	common wood pigeon	Sins (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
174_T	vowa11100	common wood pigeon	Widen (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
174_Li	vowa11100	common wood pigeon	Widen (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
175_T	vowa10989	common wood pigeon	Nottwil (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
175_Li	vowa10989	common wood pigeon	Nottwil (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
176_T	vowa10827	common wood pigeon	Reinach (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
176_Li	vowa10827	common wood pigeon	Reinach (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
177_T	vowa10944	common wood pigeon	Erlinsbach (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
177_Li	vowa10944	common wood pigeon	Erlinsbach (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
178_T	vowa11713	domestic pigeon	Reiden (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
178_Li	vowa11713	domestic pigeon	Reiden (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
179_T	vowa11028	Eurasian collared dove	Strengelbach (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

179_Li	vowa11028	Eurasian collared dove	Strengelbach (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
180_T	vowa11701	common wood pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
180_Li	vowa11701	common wood pigeon	Lucerne (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
181_T	vowa10838	feral pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
181_Li	vowa10838	feral pigeon	Lucerne (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
182_T	vowa11745	common wood pigeon	Sempach-Station (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
182_Li	vowa11745	common wood pigeon	Sempach-Station (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
183_T	vowa11702	common wood pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
138_Li	vowa11702	common wood pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
184_T	vowa11312	domestic pigeon	Emmenbruecke (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
184_Li	vowa11312	domestic pigeon	Emmenbruecke (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
185_T	vowa10767	Eurasian collared dove	Gontenschwil (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
185_Li	vowa10767	Eurasian collared dove	Gontenschwil (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
186_T	vowa10196	common wood pigeon	Emmen (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
186_Li	vowa10196	common wood pigeon	Emmen (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
187_T	vowa11020	feral pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
187_Li	vowa11020	feral pigeon	Lucerne (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
188_T	vowa10731	common wood pigeon	Sempach (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
188_Li	vowa10731	common wood pigeon	Sempach (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
189_T	vowa11729	feral pigeon	Lucerne (LU)	swab	pos. (30.6)	3.13E-04	C. psittaci, C. avium	C. psittaci (HF545614.1) (100/99)	n.d.	n.d.	n.d.

189_Li	vowa11729	feral pigeon	Lucerne (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
190_T	vowa11758	domestic pigeon	Cham (ZG)	swab	pos. (35.2)	1.56E-04	n.i.	n.i.	pos. (35.3)	n.d.	n.d.
190_Li	vowa11758	domestic pigeon	Cham (ZG)	liver	n.a.						
191_T	vowa11759	common wood pigeon	Meierskappel (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
191_Li	vowa11759	common wood pigeon	Meierskappel (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
192_T	vowa11756	domestic pigeon	Sachseln (OW)	swab	n.a.						
192_Li	vowa11756	domestic pigeon	Sachseln (OW)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
193_T	vowa11757	feral pigeon	Emmenbruecke (LU)	swab	pos. (32.3)	1.11E-02	C. psittaci	n.d.	n.d.	n.d.	n.d.
193_Li	vowa11757	feral pigeon	Emmenbruecke (LU)	liver	pos. (26.3)	4.37E-05	C. psittaci	n.d.	n.d.	n.d.	n.d.
194_T	vowa11791	domestic pigeon	Lucerne (LU)	swab	pos. (30.9)	2.66E-03	C. psittaci	n.d.	n.d.	26	B
194_Li	vowa11791	domestic pigeon	Lucerne (LU)	liver	n.a.						
195_T	vowa11789	Eurasian collared dove	Wauwil (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
195_Li	vowa11789	Eurasian collared dove	Wauwil (LU)	liver	n.a.						
196_T	vowa11788	feral pigeon	Ebikon (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
196_Li	vowa11788	feral pigeon	Ebikon (LU)	liver	n.a.						
197_T	vowa11796	common wood pigeon	Sempach (LU)	swab	pos. (33.9)	3.71E-05	n.i.	n.i.	pos. (34.1)	n.d.	n.d.
197_Li	vowa11796	common wood pigeon	Sempach (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
199_T	vowa11805	domestic pigeon	Emmenbruecke (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
199_Li	vowa11805	domestic pigeon	Emmenbruecke (LU)	liver	n.a.						
200_T	vowa11803	Eurasian collared dove	Sursee (LU)	swab	n.a.						

200_Li	vowa11803	Eurasian collared dove	Sursee (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
201_T	vowa11810	domestic pigeon	Sursee (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
201_Li	vowa11810	domestic pigeon	Sursee (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
202_T	vowa10959	feral pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
202_Li	vowa10959	feral pigeon	Lucerne (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
203_T	vowa11830	Eurasian collared dove	Seon (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
203_Li	vowa11830	Eurasian collared dove	Seon (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
204_T	vowa11824	feral pigeon	Horw (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
204_Li	vowa11824	feral pigeon	Horw (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
205_T	vowa11816	feral pigeon	Sursee (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
205_Li	vowa11816	feral pigeon	Sursee (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
206_T	vowa11838	common wood pigeon	Reinach (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
206_Li	vowa11838	common wood pigeon	Reinach (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
207_T	vowa11844	Eurasian collared dove	Nottwil (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
207_Li	vowa11844	Eurasian collared dove	Nottwil (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
208_T	vowa11823	domestic pigeon	Ettiswil (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
208_Li	vowa11823	domestic pigeon	Ettiswil (LU)	liver	n.a.						
209_T	vowa11852	domestic pigeon	Menziken (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
209_Li	vowa11852	domestic pigeon	Menziken (AG)	liver	n.a.						
210_T	vowa11851	feral pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

210_Li	vowa11851	feral pigeon	Lucerne (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
211_T	WNV002	feral pigeon	Zurich (ZH)	swab	n.a.						
211_Li	WNV002	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
212_T	WNV003	feral pigeon	Zurich (ZH)	swab	n.a.						
212_Li	WNV003	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
213_T	WNV004	feral pigeon	Zurich (ZH)	swab	n.a.						
213_Li	WNV004	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
214_T	WNV005	feral pigeon	Zurich (ZH)	swab	n.a.						
214_Li	WNV005	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
215_T	WNV006	feral pigeon	Zurich (ZH)	swab	n.a.						
215_Li	WNV006	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
216_T	WNV007	feral pigeon	Zurich (ZH)	swab	n.a.						
216_Li	WNV007	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
217_T	WNV008	feral pigeon	Zurich (ZH)	swab	n.a.						
217_Li	WNV008	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
218_T	WNV009	feral pigeon	Zurich (ZH)	swab	n.a.						
218_Li	WNV009	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
219_T	WNV010	feral pigeon	Zurich (ZH)	swab	n.a.						
219_Li	WNV010	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
220_T	WNV011	feral pigeon	Zurich (ZH)	swab	n.a.						

220_Li	WNV011	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
221_T	WNV012	feral pigeon	Zurich (ZH)	swab	n.a.						
221_Li	WNV012	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
222_T	WNV013	feral pigeon	Zurich (ZH)	swab	n.a.						
222_Li	WNV013	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
223_T	WNV014	feral pigeon	Zurich (ZH)	swab	n.a.						
223_Li	WNV014	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
224_T	WNV015	feral pigeon	Zurich (ZH)	swab	n.a.						
224_Li	WNV015	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
225_T	WNV016	feral pigeon	Zurich (ZH)	swab	n.a.						
225_Li	WNV016	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
226_T	WNV017	feral pigeon	Zurich (ZH)	swab	n.a.						
226_Li	WNV017	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
227_T	WNV018	feral pigeon	Zurich (ZH)	swab	n.a.						
227_Li	WNV018	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
228_T	WNV019	feral pigeon	Zurich (ZH)	swab	n.a.						
228_Li	WNV019	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
229_T	WNV020	feral pigeon	Zurich (ZH)	swab	n.a.						
229_Li	WNV020	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
230_T	WNV025	feral pigeon	Zurich (ZH)	swab	n.a.						

230_Li	WNV025	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
231_T	WNV026	feral pigeon	Zurich (ZH)	swab	n.a.						
231_Li	WNV026	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
232_T	WNV027	feral pigeon	Zurich (ZH)	swab	n.a.						
232_Li	WNV027	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
233_T	WNV028	feral pigeon	Zurich (ZH)	swab	n.a.						
233_Li	WNV028	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
234_T	WNV029	feral pigeon	Zurich (ZH)	swab	n.a.						
234_Li	WNV029	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
235_T	WNV030	feral pigeon	Zurich (ZH)	swab	n.a.						
235_Li	WNV030	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
236_T	WNV031	feral pigeon	Zurich (ZH)	swab	n.a.						
236_Li	WNV031	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
237_T	WNV032	feral pigeon	Zurich (ZH)	swab	n.a.						
237_Li	WNV032	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
238_T	WNV038	feral pigeon	Zurich (ZH)	swab	n.a.						
238_Li	WNV038	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
239_T	WNV039	feral pigeon	Zurich (ZH)	swab	n.a.						
239_Li	WNV039	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
240_T	WNV040	feral pigeon	Zurich (ZH)	swab	n.a.						

240_Li	WNV040	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
241_T	WNV041	feral pigeon	Zurich (ZH)	swab	n.a.						
241_Li	WNV041	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
242_T	WNV042	feral pigeon	Zurich (ZH)	swab	n.a.						
242_Li	WNV042	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
243_T	WNV043	feral pigeon	Zurich (ZH)	swab	n.a.						
243_Li	WNV043	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
244_T	WNV044	feral pigeon	Zurich (ZH)	swab	n.a.						
244_Li	WNV044	feral pigeon	Zurich (ZH)	liver	pos. (35.3)	3.36E-04	C. psittaci	n.d.	n.d.	n.d.	n.d.
245_T	WNV045	feral pigeon	Zurich (ZH)	swab	n.a.						
245_Li	WNV045	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
246_T	WNV046	feral pigeon	Zurich (ZH)	swab	n.a.						
246_Li	WNV046	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
247_T	WNV047	feral pigeon	Zurich (ZH)	swab	n.a.						
247_Li	WNV047	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
248_T	WNV048	feral pigeon	Zurich (ZH)	swab	n.a.						
248_Li	WNV048	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
249_T	WNV049	feral pigeon	Zurich (ZH)	swab	n.a.						
249_Li	WNV049	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
250_T	WNV072	domestic pigeon	Oberwil (BL)	swab	n.a.						

250_Li	WNV072	domestic pigeon	Oberwil (BL)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
251_T	WNV087	feral pigeon	Zurich (ZH)	swab	pos. (19.8)	5.45E-01	C. psittaci	n.d.	n.d.	n.d.	n.d.
251_Li	WNV087	feral pigeon	Zurich (ZH)	liver	pos. (31.3)	1.65E-05	C. psittaci	n.d.	n.d.	n.d.	n.d.
252_T	WNV088	feral pigeon	Zurich (ZH)	swab	pos. (32.2)	1.12E-04	n.i.	n.i.	pos. (31.7)	n.d.	n.d.
252_Li	WNV088	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
253_T	WNV089	feral pigeon	Zurich (ZH)	swab	pos. (38.1)	1.20E-06	n.i.	n.i.	pos. (38.1)	n.d.	n.d.
253_Li	WNV089	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
254_T	WNV090	feral pigeon	Zurich (ZH)	swab	pos. (38.9)	1.17E-06	n.i.	n.i.	pos. (38.0)	n.d.	n.d.
254_Li	WNV090	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
255_T	WNV091	feral pigeon	Zurich (ZH)	swab	pos. (35.4)	6.99E-06	n.i.	n.i.	pos. (34.9)	n.d.	n.d.
255_Li	WNV091	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
256_T	WNV092	feral pigeon	Zurich (ZH)	swab	pos. (35.5)	2.25E-05	n.i.	n.i.	pos. (35.6)	n.d.	n.d.
256_Li	WNV092	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
257_T	WNV093	feral pigeon	Zurich (ZH)	swab	pos. (39.0)	1.53E-06	n.i.	n.i.	pos. (38.2)	n.d.	n.d.
257_Li	WNV093	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
258_T	WNV095	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
258_Li	WNV095	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
259_T	WNV096	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
259_Li	WNV096	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
260_T	WNV097	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

260_Li	WNV097	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
261_T	WNV098	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
261_Li	WNV098	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
262_T	WNV119	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
262_Li	WNV119	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
263_T	WNV120	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
263_Li	WNV120	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
264_T	WNV121	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
264_Li	WNV121	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
265_T	WNV122	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
265_Li	WNV122	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
266_T	WNV139	feral pigeon	Zurich (ZH)	swab	pos. (30.2)	1.82E-04	C. psittaci	n.d.	n.d.	n.d.	n.d.
266_Li	WNV139	feral pigeon	Zurich (ZH)	liver	pos. (30.6)	3.46E-05	C. psittaci	n.d.	n.d.	n.d.	n.d.
267_T	WNV140	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
267_Li	WNV140	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
268_T	WNV141	feral pigeon	Zurich (ZH)	swab	pos. (31.3)	9.69E-05	C. psittaci	n.d.	n.d.	n.d.	n.d.
268_Li	WNV141	feral pigeon	Zurich (ZH)	liver	pos. (33.4)	7.17E-06	C. psittaci	n.d.	n.d.	n.d.	n.d.
269_T	WNV142	feral pigeon	Zurich (ZH)	swab	pos. (34.9)	1.08E-05	n.i.	n.i.	pos. (38.7)	n.d.	n.d.
269_Li	WNV142	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
270_T	WNV143	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

270_Li	WNV143	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
271_T	WNV144	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
271_Li	WNV144	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
272_T	WNV145	feral pigeon	Zurich (ZH)	swab	pos. (32.5)	2.58E-05	n.i.	n.i.	pos. (33.1)	n.d.	n.d.
272_Li	WNV145	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
273_T	WNV146	feral pigeon	Zurich (ZH)	swab	pos. (26.1)	2.92E-03	C. psittaci	n.d.	n.d.	n.d.	n.d.
273_Li	WNV146	feral pigeon	Zurich (ZH)	liver	pos. (34.8)	2.77E-06	C. psittaci	n.d.	n.d.	n.d.	n.d.
274_T	WNV150	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
274_Li	WNV150	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
275_T	WNV151	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
275_Li	WNV151	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
276_T	WNV152	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
276_Li	WNV152	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
277_T	WNV153	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
277_Li	WNV153	feral pigeon	Zurich (ZH)	liver	n.a.						
278_T	WNV154	feral pigeon	Zurich (ZH)	swab	pos. (29.9)	4.26E-05	C. psittaci	n.d.	n.d.	n.d.	n.d.
278_Li	WNV154	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
279_T	WNV156	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
279_Li	WNV156	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
280_T	WNV157	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

280_Li	WNV157	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
281_T	WNV158	feral pigeon	Zurich (ZH)	swab	pos. (24.9)	1.78E-02	C. avium	C. avium (NR_121781.1) (100/99)	n.d.	n.d.	n.d.
281_Li	WNV158	feral pigeon	Zurich (ZH)	liver	pos. (27.0)	4.66E-04	C. avium	C. avium (NR_121781.1) (100/99)	n.d.	n.d.	n.d.
282_T	WNV159	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
282_Li	WNV159	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
283_T	WNV160	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
283_Li	WNV160	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
284_T	WNV161	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
284_Li	WNV161	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
285_T	WNV162	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
285_Li	WNV162	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
286_T	WNV168	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
286_Li	WNV168	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
287_T	WNV169	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
287_Li	WNV169	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
288_T	WNV170	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
288_Li	WNV170	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
289_T	WNV171	feral pigeon	Zurich (ZH)	swab	pos. (33.9)	3.32E-05	n.i.	C. avium (KF366259.1) (98/99)	n.d.	n.d.	n.d.
289_Li	WNV171	feral pigeon	Zurich (ZH)	liver	pos. (31.7)	7.18E-06	C. avium	C. avium KF366259.1 (99/99)	n.d.	n.d.	n.d.

290_T	WNV172	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
290_Li	WNV172	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
291_T	WNV173	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
291_Li	WNV173	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
292_T	WNV174	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
292_Li	WNV174	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
293_T	WNV178	feral pigeon	Greifensee (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
293_Li	WNV178	feral pigeon	Greifensee (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
294_T	WNV179	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
294_Li	WNV179	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
295_T	WNV180	feral pigeon	Zurich (ZH)	swab	pos. (27.5)	5.13E-03	C. psittaci	n.d.	n.d.	n.d.	n.d.
295_Li	WNV180	feral pigeon	Zurich (ZH)	liver	pos. (29.1)	1.17E-04	C. psittaci	n.d.	n.d.	n.d.	n.d.
296_T	WNV181	feral pigeon	Zurich (ZH)	swab	pos. (39.3)	8.31E-07	n.i.	n.i.	pos. (37.1)	n.d.	n.d.
296_Li	WNV181	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
297_T	WNV182	feral pigeon	Zurich (ZH)	swab	n.a.						
297_Li	WNV182	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
298_T	WNV183	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
298_Li	WNV183	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
299_T	WNV184	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
299_Li	WNV184	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

300_T	WNV206	feral pigeon	Zurich (ZH)	swab	pos. (33.9)	2.68E-04	n.i.	n.i.	pos. (34.4)	n.d.	n.d.
300_Li	WNV206	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
301_T	WNV207	feral pigeon	Zurich (ZH)	swab	pos. (21.1)	3.60E-01	C. psittaci	n.d.	n.d.	n.d.	n.d.
301_Li	WNV207	feral pigeon	Zurich (ZH)	liver	pos. (34.1)	4.45E-06	C. psittaci	n.d.	n.d.	n.d.	n.d.
302_T	WNV208	feral pigeon	Zurich (ZH)	swab	pos. (31.5)	3.10E-04	C. psittaci	n.d.	n.d.	n.d.	n.d.
302_Li	WNV208	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
303_T	WNV209	feral pigeon	Zurich (ZH)	swab	pos. (18.8)	1.39E+00	C. psittaci	n.d.	n.d.	212	B
303_Li	WNV209	feral pigeon	Zurich (ZH)	liver	pos. (31.0)	1.77E-07	C. psittaci	n.d.	n.d.	n.d.	n.d.
304_T	WNV210	feral pigeon	Zurich (ZH)	swab	pos. (19.6)	9.19E-01	C. psittaci	n.d.	n.d.	n.d.	n.d.
304_Li	WNV210	feral pigeon	Zurich (ZH)	liver	pos. (31.4)	1.48E-04	C. psittaci	n.d.		n.d.	n.d.
305_T	WNV238	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
305_Li	WNV238	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
306_T	WNV239	feral pigeon	Zurich (ZH)	swab	pos. (24.4)	1.45E-02	C. psittaci	n.d.	n.d.	n.d.	n.d.
306_Li	WNV239	feral pigeon	Zurich (ZH)	liver	pos. (32.7)	5.80E-06	C. psittaci	n.d.	n.d.	n.d.	n.d.
307_T	WNV240	feral pigeon	Zurich (ZH)	swab	pos. (28.4)	9.17E-04	C. psittaci	n.d.	n.d.	n.d.	n.d.
307_Li	WNV240	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
308_T	WNV241	feral pigeon	Zurich (ZH)	swab	pos. (30.0)	7.91E-02	C. psittaci	n.d.	n.d.	n.d.	n.d.
308_Li	WNV241	feral pigeon	Zurich (ZH)	liver	pos. (30.0)	7.10E-04	C. psittaci	n.d.	n.d.	n.d.	n.d.
309_T	WNV242	feral pigeon	Zurich (ZH)	swab	pos. (36.6)	4.45E-06	n.i.	n.i.	pos. (34.8)	n.d.	n.d.
309_Li	WNV242	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

310_T	WNV243	feral pigeon	Zurich (ZH)	swab	pos. (30.2)	2.47E-04	C. psittaci	n.d.	n.d.	n.d.	n.d.
310_Li	WNV243	feral pigeon	Zurich (ZH)	liver	pos. (34.5)	1.01E-06	n.i.	n.i.	pos. (35.5)	n.d.	n.d.
311_T	WNV244	feral pigeon	Zurich (ZH)	swab	pos. (34.5)	2.48E-05	n.i.	n.i.	pos. (35.1)	n.d.	n.d.
311_Li	WNV244	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
312_T	WNV247	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
312_Li	WNV247	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
313_T	WNV248	feral pigeon	Zurich (ZH)	swab	pos. (38.9)	1.14E-06	n.i.	n.i.	pos. (36.5)	n.d.	n.d.
313_Li	WNV248	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
314_T	WNV249	feral pigeon	Zurich (ZH)	swab	pos. (28.6)	1.10E-02	C. psittaci	n.d.	n.d.	n.d.	n.d.
314_Li	WNV249	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
315_T	WNV250	feral pigeon	Zurich (ZH)	swab	pos. (19.8)	9.92E-01	C. psittaci	n.d.	n.d.	212	B
315_Li	WNV250	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
316_T	WNV250	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
316_Li	WNV250	feral pigeon	Zurich (ZH)	liver	n.a.						
317_T	WNV256	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
317_Li	WNV256	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
318_T	WNV257	feral pigeon	Zurich (ZH)	swab	n.a.						
318_Li	WNV257	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
319_T	WNV258	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
319_Li	WNV258	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

320_T	WNV259	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
320_Li	WNV259	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
321_T	WNV260	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
321_Li	WNV260	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
322_T	WNV265	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
322_Li	WNV265	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
323_T	WNV266	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
323_Li	WNV266	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
324_T	WNV267	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
324_Li	WNV267	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
325_T	WNV268	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
325_Li	WNV268	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
326_T	WNV269	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
326_Li	WNV269	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
327_T	WNV270	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
327_Li	WNV270	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
328_T	WNV276	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
328_Li	WNV276	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
329_T	WNV277	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
329_Li	WNV277	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

330_T	WNV278	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
330_Li	WNV278	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
331_T	WNV279	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
331_Li	WNV279	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
332_T	WNV280	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
332_Li	WNV280	feral pigeon	Zurich (ZH)	liver	pos. (31.1)	7.38E-04	C. psittaci	n.d.	n.d.	n.d.	n.d.
333_T	WNV281	feral pigeon	Zurich (ZH)	swab	pos. (28.6)	5.62E-04	C. psittaci	n.d.	n.d.	n.d.	n.d.
333_Li	WNV281	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
334_T	WNV286	feral pigeon	Zurich (ZH)	swab	pos. (20.8)	3.67E-02	C. psittaci	n.d.	n.d.	n.d.	n.d.
334_Li	WNV286	feral pigeon	Zurich (ZH)	liver	pos. (31.0)	3.51E-04	C. psittaci	n.d.	n.d.	n.d.	n.d.
335_T	WNV287	feral pigeon	Kloten (ZH)	swab	pos. (34.3)	8.23E+00	n.i.	n.i.	pos. (34.8)	n.d.	n.d.
335_Li	WNV287	feral pigeon	Kloten (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
336_T	WNV288	feral pigeon	Zurich (ZH)	swab	n.a.						
336_Li	WNV288	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
337_T	WNV289	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
337_Li	WNV289	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
338_T	WNV290	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
338_Li	WNV290	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
339_T	WNV291	feral pigeon	Zuzwil (AG)	swab	pos. (33.3)	6.75E-07	n.i.	n.i.	pos. (32.4)	n.d.	n.d.
339_Li	WNV291	feral pigeon	Zuzwil (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

340_T	WNV293	feral pigeon	Zurich (ZH)	swab	pos. (36.5)	3.00E-08	n.i.	n.i.	pos. (36.0)	n.d.	n.d.
340_Li	WNV293	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
341_T	WNV294	feral pigeon	Zurich (ZH)	swab	pos. (24.5)	3.20E-02	C. psittaci	n.d.	n.d.	n.d.	n.d.
341_Li	WNV294	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
342_T	WNV295	feral pigeon	Zurich (ZH)	swab	pos. (39.6)	4.46E-07	n.i.	n.i.	pos. (37.9)	n.d.	n.d.
342_Li	WNV295	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
343_T	WNV296	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
343_Li	WNV296	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
344_T	WNV297	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
344_Li	WNV297	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
345_T	WNV306	feral pigeon	Uster (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
345_Li	WNV306	feral pigeon	Uster (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
346_T	WNV309	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
346_Li	WNV309	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
347_T	WNV310	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
347_Li	WNV310	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
348_T	WNV311	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
348_Li	WNV311	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
349_T	WNV312	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
349_Li	WNV312	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

350_T	WNV313	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
350_Li	WNV313	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
351_T	WNV314	feral pigeon	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
351_Li	WNV314	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
352_T	WNV325	feral pigeon	Zurich (ZH)	swab	n.a.						
352_Li	WNV325	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
353_T	WNV326	feral pigeon	Zurich (ZH)	swab	n.a.						
353_Li	WNV326	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
354_T	WNV327	feral pigeon	Zurich (ZH)	swab	n.a.						
354_Li	WNV327	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
355_T	WNV328	feral pigeon	Zurich (ZH)	swab	n.a.						
355_Li	WNV328	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
356_T	WNV329	feral pigeon	Zurich (ZH)	swab	n.a.						
356_Li	WNV329	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
357_T	WNV330	feral pigeon	Zurich (ZH)	swab	n.a.						
357_Li	WNV330	feral pigeon	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
358_T	vowa12004	common wood pigeon	Emmenbruecke (LU)	swab	n.a.						
358_Li	vowa12004	common wood pigeon	Emmenbruecke (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
359_T	vowa13006	feral pigeon	Aarburg (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
359_Li	vowa13006	feral pigeon	Aarburg (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

360_T	vowa12997	Eurasian collared dove	Nottwil (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
360_Li	vowa12997	Eurasian collared dove	Nottwil (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
361_T	vowa12815-2	feral pigeon	Mettmenstetten (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
361_Li	vowa12815-2	feral pigeon	Mettmenstetten (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
362_T	vowa12722	domestic pigeon	Schlierbach (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
362_Li	vowa12722	domestic pigeon	Schlierbach (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
363_T	vowa12974	Eurasian collared dove	Neuenkirch (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
363_Li	vowa12974	Eurasian collared dove	Neuenkirch (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
364_T	vowa12829	feral pigeon	Hendschiken (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
364_Li	vowa12829	feral pigeon	Hendschiken (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
365_T	vowa12996	Eurasian collared dove	Bremgarten (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
365_Li	vowa12996	Eurasian collared dove	Bremgarten (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
366_T	vowa12857	common wood pigeon	Sempach (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
366_Li	vowa12857	common wood pigeon	Sempach (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
367_T	vowa12257	feral pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
367_Li	vowa12257	feral pigeon	Lucerne (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
368_T	vowa12090	common wood pigeon	Emmen (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
368_Li	vowa12090	common wood pigeon	Emmen (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
369_T	vowa12880	Eurasian collared dove	Inwil (LU)	swab	pos. (39.0)	1.69E-05	C. psittaci	n.d.	n.d.	n.d.	n.d.
369_Li	vowa12880	Eurasian collared dove	Inwil (LU)	liver	pos. (39.0)	6.70E-08	n.i.	n.i.	pos. (39.2)	n.d.	n.d.

370_T	vowa12100	common wood pigeon	Oberentfelden (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
370_Li	vowa12100	common wood pigeon	Oberentfelden (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
371_T	vowa12787	Eurasian collared dove	Malters (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
371_Li	vowa12787	Eurasian collared dove	Malters (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
372_T	vowa12465	feral pigeon	Kuessnacht am Rigi (SZ)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
372_Li	vowa12465	feral pigeon	Kuessnacht am Rigi (SZ)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
373_T	vowa12815-1	feral pigeon	Mettmenstetten (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
373_Li	vowa12815-1	feral pigeon	Mettmenstetten (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
374_T	vowa13098	Eurasian collared dove	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
374_Li	vowa13098	Eurasian collared dove	Lucerne (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
375_T	vowa12078	feral pigeon	Uster (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
375_Li	vowa12078	feral pigeon	Uster (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
376_T	vowa12050	common wood pigeon	Eich (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
376_Li	vowa12050	common wood pigeon	Eich (LU)	liver	pos. (35.7)	1.18E-06	C. psittaci	n.d.	n.d.	n.d.	n.d.
377_T	vowa12253	feral pigeon	Lucerne (LU)	swab	pos. (23.3)	6.63E-02	C. psittaci	n.d.	n.d.	27	B
377_Li	vowa12253	feral pigeon	Lucerne (LU)	liver	pos. (23.4)	7.13E-02	C. psittaci	n.d.	n.d.	27	B
378_T	vowa12054	domestic pigeon	Stallikon (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
378_Li	vowa12054	domestic pigeon	Stallikon (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
379_T	vowa12452	feral pigeon	Emmenbruecke (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
379_Li	vowa12452	feral pigeon	Emmenbruecke (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

380_T	vowa12875	feral pigeon	unknown	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
380_Li	vowa12875	feral pigeon	unknown	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
381_T	vowa12875	common wood pigeon	Lachen (SZ)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
381_Li	vowa12875	common wood pigeon	Lachen (SZ)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
382_T	vowa12454	common wood pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
382_Li	vowa12454	common wood pigeon	Lucerne (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
383_T	vowa12884	domestic pigeon	Aarburg (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
383_Li	vowa12884	domestic pigeon	Aarburg (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
384_T	vowa12047	common wood pigeon	Triengen (LU)	swab	n.a.						
384_Li	vowa12047	common wood pigeon	Triengen (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
385_T	vowa12477	domestic pigeon	Buochs (NW)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
385_Li	vowa12477	domestic pigeon	Buochs (NW)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
386_T	vowa12023	common wood pigeon	Emmenbruecke (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
386_Li	vowa12023	common wood pigeon	Emmenbruecke (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
387_T	vowa11997	Eurasian collared dove	Kriens (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
387_Li	vowa11997	Eurasian collared dove	Kriens (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
388_T	vowa11868	common wood pigeon	Ruswil (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
388_Li	vowa11868	common wood pigeon	Ruswil (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
389_T	vowa11913	feral pigeon	Reinach (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
389_Li	vowa11913	feral pigeon	Reinach (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

390_T	vowa11928	feral pigeon	Reinach (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
390_Li	vowa11928	feral pigeon	Reinach (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
391_T	vowa11934	feral pigeon	Reinach (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
391_Li	vowa11934	feral pigeon	Reinach (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
392_T	vowa12612	feral pigeon	Sursee (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
392_Li	vowa12612	feral pigeon	Sursee (LU)	liver	n.a.						
393_T	vowa12531	domestic pigeon	Lucerne (LU)	swab	pos. (32.7)	4.86E-05	C. avium	C. avium (NR_121781.1; 98% query cover, 99% ident)	n.d.	n.d.	n.d.
393_Li	vowa12531	domestic pigeon	Lucerne (LU)	liver	n.a.						
394_T	vowa11901	feral pigeon	Emmenbruecke (LU)	swab	pos. (28.4)	9.36E-02	C. psittaci	n.d.	n.d.	213	E
394_Li	vowa11901	feral pigeon	Emmenbruecke (LU)	liver	n.a.						
395_T	vowa12613	Eurasian collared dove	Hochdorf (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
395_Li	vowa12613	Eurasian collared dove	Hochdorf (LU)	liver	n.a.						
396_T	vowa12483	domestic pigeon	Buchs (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
396_Li	vowa12483	domestic pigeon	Buchs (LU)	liver	n.a.						
397_T	vowa12389	domestic pigeon	Hitzkirch (LU)	swab	pos. (33.2)	1.31E-05	C. avium	C. avium (NR_121781.1; 98% query cover, 99% ident)	n.d.	n.d.	n.d.
397_Li	vowa12389	domestic pigeon	Hitzkirch (LU)	liver	n.a.						
398_T	vowa12364	domestic pigeon	Hergiswil (NW)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
398_Li	vowa12364	domestic pigeon	Hergiswil (NW)	liver	n.a.						

399_T	vowa12173	domestic pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
399_Li	vowa12173	domestic pigeon	Lucerne (LU)	liver	n.a.						
400_T	vowa12262-1	feral pigeon	Eschenbach (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
400_Li	vowa12262-1	feral pigeon	Eschenbach (LU)	liver	n.a.						
401_T	vowa12262-2	feral pigeon	Eschenbach (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
401_Li	vowa12262-2	feral pigeon	Eschenbach (LU)	liver	n.a.						
402_T	vowa12068	domestic pigeon	Schlossrued (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
402_Li	vowa12068	domestic pigeon	Schlossrued (AG)	liver	n.a.						
403_T	vowa12244	Eurasian collared dove	Adligenswil (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
403_Li	vowa12244	Eurasian collared dove	Adligenswil (LU)	liver	n.a.						
404_T	vowa12250	common wood pigeon	Sursee (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
404_Li	vowa12250	common wood pigeon	Sursee (LU)	liver	n.a.						
405_T	vowa12053	Eurasian collared dove	Ballwil (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
405_Li	vowa12053	Eurasian collared dove	Ballwil (LU)	liver	n.a.						
406_T	vowa12082	Eurasian collared dove	Sursee (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
406_Li	vowa12082	Eurasian collared dove	Sursee (LU)	liver	n.a.						
407_T	vowa12030-1	Eurasian collared dove	Seengen (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
407_Li	vowa12030-1	Eurasian collared dove	Seengen (AG)	liver	n.a.						
408_T	vowa12030-2	Eurasian collared dove	Seengen (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
408_Li	vowa12030-2	Eurasian collared dove	Seengen (AG)	liver	n.a.						

409_T	vowa12026	Eurasian collared dove	Kuessnacht am Rigi (SZ)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
409_Li	vowa12026	Eurasian collared dove	Kuessnacht am Rigi (SZ)	liver	n.a.						
410_T	vowa12021	domestic pigeon	Villmergen (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
410_Li	vowa12021	domestic pigeon	Villmergen (AG)	liver	n.a.						
411_T	vowa12007	feral pigeon	Buchrain (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
411_Li	vowa12007	feral pigeon	Buchrain (LU)	liver	n.a.						
412_T	vowa11981	Eurasian collared dove	Engelberg (OW)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
412_Li	vowa11981	Eurasian collared dove	Engelberg (OW)	liver	n.a.						
413_T	vowa11985	Eurasian collared dove	Ettiswil (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
413_Li	vowa11985	Eurasian collared dove	Ettiswil (LU)	liver	n.a.						
414_T	vowa11929	feral pigeon	Sursee (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
414_Li	vowa11929	feral pigeon	Sursee (LU)	liver	n.a.						
415_T	vowa11943	feral pigeon	Kriens (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
415_Li	vowa11943	feral pigeon	Kriens (LU)	liver	n.a.						
416_T	vowa11927	domestic pigeon	Malters (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
416_Li	vowa11927	domestic pigeon	Malters (LU)	liver	n.a.						
417_T	vowa11902	domestic pigeon	Emmenbruecke (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
417_Li	vowa11902	domestic pigeon	Emmenbruecke (LU)	liver	n.a.						
418_T	vowa12099	feral pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
418_Li	vowa12099	feral pigeon	Lucerne (LU)	liver	n.a.						

419_T	vowa12949	Eurasian collared dove	Rain (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
419_Li	vowa12949	Eurasian collared dove	Rain (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
420_T	vowa13156	common wood pigeon	Nottwil (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
420_Li	vowa13156	common wood pigeon	Nottwil (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
421_T	vowa13140	feral pigeon	Emmenbruecke (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
421_Li	vowa13140	feral pigeon	Emmenbruecke (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
422_T	Mythenquai01	Eurasian collared dove	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
422_Li	Mythenquai01	Eurasian collared dove	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
423_T	Mythenquai02	feral pigeon	Zurich (ZH)	swab	pos. (20.7)	3.50E-02	C. psittaci	n.d.	n.d.	n.d.	n.d.
423_Li	Mythenquai02	feral pigeon	Zurich (ZH)	liver	pos. (27.4)	1.11E-03	C. psittaci	n.d.	n.d.	n.d.	n.d.
424_T	Mythenquai03	Eurasian collared dove	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
424_Li	Mythenquai03	Eurasian collared dove	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
425_T	Mythenquai04	domestic pigeon	Bertschikon (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
425_Li	Mythenquai04	domestic pigeon	Bertschikon (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
426_T	Mythenquai05	Eurasian collared dove	Zurich (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
426_Li	Mythenquai05	Eurasian collared dove	Zurich (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
427_T	AW01	Eurasian collared dove	unknown	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
427_Li	AW01	Eurasian collared dove	unknown	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
428_T	AW02	feral pigeon	Oftringen (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
428_Li	AW02	feral pigeon	Oftringen (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

429_T	vowa13275	feral pigeon	Rothenburg (LU)	swab	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
429_Li	vowa13275	feral pigeon	Rothenburg (LU)	liver	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
430_T	SH357	Eurasian collared dove	Embrach (ZH)	swab	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
430_Li	SH357	Eurasian collared dove	Embrach (ZH)	liver	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
431_T	SH509	feral pigeon	Schaffhausen (SH)	swab	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
431_Li	SH509	feral pigeon	Schaffhausen (SH)	liver	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
432_T	Uster01	feral pigeon	Uster (ZH)	swab	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
432_Li	Uster01	feral pigeon	Uster (ZH)	liver	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
433_T	Ustr02	feral pigeon	Uster (ZH)	swab	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
433_Li	Ustr02	feral pigeon	Uster (ZH)	liver	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
434_T	vowa13981	common wood pigeon	Aarau (AG)	swab	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
434_Li	vowa13981	common wood pigeon	Aarau (AG)	liver	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
435_T	Kreuzlingen01	Eurasian collared dove	unknown	swab	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
435_Li	Kreuzlingen01	Eurasian collared dove	unknown	liver	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
436_T	Kreuzlingen02	common wood pigeon	unknown	swab	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
436_Li	Kreuzlingen02	common wood pigeon	unknown	liver	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
437_T	Kreuzlingen03	domestic pigeon	unknown	swab	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
437_Li	Kreuzlingen03	domestic pigeon	unknown	liver	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
438_T	Kreuzlingen04	feral pigeon	unknown	swab	neg.	n.d.	n.d.	n.d.	n.d.	n.d.
438_Li	Kreuzlingen04	feral pigeon	unknown	liver	neg.	n.d.	n.d.	n.d.	n.d.	n.d.

439_T	Kreuzlingen05	Eurasian collared dove	unknown	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
439_Li	Kreuzlingen05	Eurasian collared dove	unknown	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
440_T	Kreuzlingen06	domestic pigeon	unknown	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
440_Li	Kreuzlingen06	domestic pigeon	unknown	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
441_T	Kreuzlingen07	domestic pigeon	unknown	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
441_Li	Kreuzlingen07	domestic pigeon	unknown	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
442_T	Kreuzlingen08	Eurasian collared dove	unknown	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
442_Li	Kreuzlingen08	Eurasian collared dove	unknown	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
443_T	vowa13748	common wood pigeon	Sempach (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
443_Li	vowa13748	common wood pigeon	Sempach (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
444_T	vowa13529	Eurasian collared dove	Hochdorf (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
444_Li	vowa13529	Eurasian collared dove	Hochdorf (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
445_T	vowa13766	feral pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
445_Li	vowa13766	feral pigeon	Lucerne (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
446_T	vowa13717	common wood pigeon	Birmensdorf (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
446_Li	vowa13717	common wood pigeon	Birmensdorf (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
447_T	vowa13662	common wood pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
447_Li	vowa13662	common wood pigeon	Lucerne (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
448_T	vowa13818	common wood pigeon	Emmenbruecke (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
448_Li	vowa13818	common wood pigeon	Emmenbruecke (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

449_T	vowa14071	domestic pigeon	Lucerne (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
449_Li	vowa14071	domestic pigeon	Lucerne (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
450_T	vowa14058	Eurasian collared dove	Neuenhof (AG)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
450_Li	vowa14058	Eurasian collared dove	Neuenhof (AG)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
451_T	vowa14036	Eurasian collared dove	Inwil (LU)	swab	pos. (16.9)	6.02E-01	C. psittaci	n.d.	n.d.	216	B#
451_Li	vowa14036	Eurasian collared dove	Inwil (LU)	liver	pos. (28.1)	8.62E-05	C. psittaci	n.d.	n.d.	n.d.	n.d.
452_T	vowa14013	common wood pigeon	Hildisrieden (LU)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
452_Li	vowa14013	common wood pigeon	Hildisrieden (LU)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
453_T	vowa14047	common wood pigeon	Affoltern am Albis (ZH)	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
453_Li	vowa14047	common wood pigeon	Affoltern am Albis (ZH)	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
454_T	SH000	common wood pigeon	unknown	swab	neg.		n.d.	n.d.	n.d.	n.d.	n.d.
454_Li	SH000	common wood pigeon	unknown	liver	neg.		n.d.	n.d.	n.d.	n.d.	n.d.

“T”: swab sample; “Li”: liver sample; „neg.“: negative; „pos.“: positive; „n.a.“: not available; „n.d.“: not done; „n.i.“: not identified;

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